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### **Pneumatic Interlocking—High or Low Pressure.**

**To the Editor of the Railroad Gazette:**

It hardly seems profitable to continue the controversy in regard to "high and low pressure pneumatic interlocking;" but the letter of Mr. J. P. Coleman, printed in your issue of September 22, contains some statements so at variance with facts that some answer from the writer seems called for.

The amount of power used by the two systems can only be properly compared by rating the compressors furnishing air for two plants of the different systems doing the same amount of work. It is obvious that less power is required to operate the low pressure all-air system than the high pressure air and electric system. Of course, the same amount of power must be applied to a switch or a signal to do the same amount of work in any system, whether mechanical, pneumatic or electro-pneumatic. The saving of the power in the low pressure system over the high pressure system is due to the greater economy of using low pressures, to the absence of appreciable leaks in the piping, and to the entire absence of leaks in cylinders when the mechanisms are at rest. Part of the economy is also due to the decreased cost of the use of air instead of electricity for the operation of the valves, not to mention the convenience of furnishing only one kind of power for the plant.

Mr. Coleman lays stress on the amount of air used in the operating pipes of the "all-air system," though it is probable that he made an error in assuming that all the air in these pipes was exhausted at each operation of the switch valve; thus, making it appear that the amount of air used for these pipes was much greater than is actually the case. It could hardly be possible to use pressures below that of the atmosphere to advantage.

In regard to this discussion being based alone upon general considerations, the writer fails to see why that is not perfectly proper. The operation of double slip switches with movable point frogs, even with 100 lbs. rails and  $\frac{1}{2}$  in. detector bars, is accomplished with the low pressure system by other means than increasing the size of the cylinders or amount of pressure.

It is, to say the least, a very questionable practice in interlocking signals to place a minimum strain of 2,500 lbs., or a maximum, which must be at least 3,000 lbs., on a detector bar where, under certain conditions, the entire strain may come on a 5% in. stud, or what is more serious in case of a broken pipe carrier, this whole strain may be applied to buckle a 1 in. pipe with supports 12 or 14 ft. apart.

Mr. Coleman asks why, in the Buffalo installation, it became necessary to attach the electric locking to the levers, and the writer answers this question by saying that in designing that plant he had in mind the electro-pneumatic block system, where gravity alone is depended upon to return the signals to danger; and further, that the failure of these signals to so return might not be noticed for some days, so he took it for granted that he could rely upon the same agent to perform the same service for the few signals connected with this interlocking plant, nearly all of which are in sight of the operator. He found, however, that he was not entirely correct in this supposition, and at the request of the railroad company the question of signal indicators had to be solved. In this case, as the plant was already in service and at a very busy

point where any interference with the operation of the signals was to be avoided if possible, it was decided for these reasons to use electricity. Since this plant was installed, several other plants containing the same low pressure principle are being put in service where the signal indicators, and, in fact, all the indications are successfully performed by compressed air; thus, fully realizing the first expectations of "eliminating electricity from power interlocking."

It is a curious anomaly that the railroads of the country are willing to rely entirely upon gravity to return automatic block signals to danger, when they refuse to rely upon this agency in interlocking signals, even when in sight of operators.

F. L. DODGSON.

The annual track inspection of the Pennsylvania Lines West of Pittsburgh was made last week, beginning at Pittsburgh, at 7 o'clock on the morning of Tuesday, Oct. 24, and ending at Toledo, Friday evening. Obviously, it is impracticable to go over the whole or any very large part of the mileage of this system in any one year, and this year the inspection covered the Pittsburgh Division, Eastern Division, Cleveland & Pittsburgh Division, Erie & Ashtabula Division and Toledo Division. The inspection party included the General Manager, the General Superintendent of Transportation, the General Superintendents of the two main systems and Division Superintendents, Engineers of Maintenance of Way, Assistant Engineers and Supervisors, numbering in all probably from 125 to 150 men. The matter was admirably organized, the party being carried in three trains with ample commissary and sleeping accommodations, so that the expedition was entirely independent of hotels.

The premiums awarded were the General Manager's first and second prizes for line and surface for the best and second best Supervisor's division, being \$100 and \$50; also premiums of \$50 for the best section on each Supervisor's division. The first prize was awarded to Mr. M. Ryan, Supervisor of the Cleveland & Pittsburgh Division, and the second to Mr. P. J. Adams, Supervisor of the Toledo Division.

No man who had the privilege of making the trip with this party could fail to be much impressed by the organization which he saw, the quality of the men, the physical condition of the property and the complexity and magnitude of the business interests involved. It seems as if it must be difficult to get together on any other railroad a body of men so well chosen and trained and so thoroughly imbued with the proper professional spirit with regard to the properties which they are working as were assembled on this occasion; and the moral effect upon all of the corps from the top to the bottom must be extremely valuable.

Much the largest part of the line gone over is single track and it is off the route of the great trunk line and passenger traffic, but the business done on it is very heavy. The movement of coal to the Lakes and of ore to the Pittsburgh district, and the movement to and from the great industrial centers is, as a matter of course, intense. Over parts of these single track lines as many as 75 trains a day are now moved and at times this summer the movement has risen to 90 or more. It is probable, too, that between Pittsburgh and Lake Erie are found the heaviest trains in the world and the heaviest engine ratings; at least we have never heard of any so heavy.

At the National Export Exposition in Philadelphia, on Wednesday of last week, Mr. G. H. Daniels, General Passenger Agent of the New York Central & Hudson River and President of the American Association of General Passenger Agents, delivered an interesting address on "American Railroads and Their Relation to Commercial, Industrial and Agricultural Interests."

Mr. Daniels began with a rapid review of the great expansion of our foreign commerce during the past few years. Since the war between Japan and China, Americans have shipped greatly increased quantities of manufactures of all kinds to Asia and Africa. The Trans-Siberian Railroad is being finished two years sooner than was expected, because of the use of American material. The tracks will have steel rails made in Pennsylvania, and sleepers from the forests of Oregon, and trains will be hauled by American locomotives. Mr. Daniels has lately had requests from Germany and other foreign countries for detailed information about the splendid passenger trains on his road. Prince Hilkoﬀ, who visited this country a few years ago, has built for the Russian railroads a train like the limited trains of the Central and the Pennsylvania. The demand for American locomotives from all parts of the world is to be attributed partly to the fact that our general passenger agents have, through their advertising, made the splendid service of our locomotives well known to every country on the globe.

Mr. Daniels paid a tribute to the navy, dwelling

on the renown of the battleship Oregon and its voyage around Cape Horn, and then went on to discuss the prospects of foreign trade in connection with the new possessions of the United States.

Railroads are coming to be the most important interest in all countries. The German Emperor lays more stress on transportation than on appropriations for the army or the navy. Russia is to spend 109,000,000 rubles on railroads this year. Two railroad men, De Witte and Hilkoff, hold high positions in the Russian Imperial Ministry.

Mr. Daniel closed with a review of the rapid progress in our western States. In 1875 food and clothing had to be sent to starving people in Kansas. This year that State will furnish the world 340,000,000 bushels of corn. The vineyards and orange groves of California are possible only because of the enterprise of railroads and the perfection of the refrigerator and ventilated fruit cars which take the products to Eastern markets.

There are a number of different conditions in the construction and maintenance of railroad cars and locomotives which are directly responsible for sharp, vertical, or thin flanges. In the first place, take the question of mounting wheels on axles. There are many car and machine shops which, either from lack of knowledge or from sheer carelessness, do not give proper attention to the fitting, and especially the mating, of wheels. Consequently there are many cases where two wheels of different diameters are pressed on the same axle. When a pair of 33-in. wheels is mounted with one wheel  $\frac{1}{4}$  in. larger than the other, the larger wheel is compelled to travel from 18 to 24 ft. farther in a mile than its mate, and the consequence is that the small wheel is crowded up against the rail, and is held there until a sharp flange is formed. Also, as one wheel is forced to travel faster than the other, one of them is compelled to slide sufficiently to compensate for the difference in diameter. This, and the fact that the wheels are subjected to very heavy loads, brings an enormous pressure on the wheel flange. Wheel flanges are not designed to be subjected to this kind of strain, and the result is that they sometimes become loose. Also, the wheel, which is forced up against the rail, is continually hunting a place to get off the track, and if there happens to be a defective rail or switch on that side of the track, it will be sure to find it. Further, as the larger wheel is traveling far over on the tread, if there is any part of the track which has become weak or spread, the wheel will get off if there is the least possible chance.

Some shops use, in mating wheels, the large caliper, which is a very crude way of determining the size of wheels. But in most of the eastern shops the tape, such as is recommended as standard by the Master Car Builders' Association, is used, and is considered the only safe way of measuring and mating wheels. Too much care cannot be taken in this setting up and mating of wheels, and there seems to be no excuse for poor work. Next, take the pressing on of wheels to gage. This is another point of importance to insure good flange wear. The man who will press two wheels on the same axle, each of different diameter, is very apt to be careless about pressing them on to the proper gage, and is almost certain to pay little or no attention to the variation of the thickness of the flanges, which are very seldom of a perfect or uniform thickness throughout the entire circumference. The wheels are also apt to be slightly warped, and if no care is taken in mating them according to the variation of the flanges, they are likely to be in proper gage at one point, and a good way out at others. The place to detect these non-uniform flanges is on the boring mill, where the highest point on the flange can be easily marked with a piece of chalk, as the wheel is revolving. Then, as the two wheels, which have been mated and properly marked, come to the press, the two high points on the flanges can be placed exactly opposite each other with respect to the axle, which will give the best average that can be obtained without expense or loss of time.

Properly constructed and good-fitting center plates are also an important factor in car construction to insure the car curving easily, and incidentally good flange wear. There is such a large variety of center plates, and so many different ideas as to the proper size, construction and material, that it is hard to decide which is most suitable. They are made in all sizes, from the old Empire style, which is about 2 ft. in diameter, down to the very small plain bearing, which is from 8 to 10 in. in diameter. The Empire center plate, which is used very extensively by the Pennsylvania and the Empire Line, is a very large plate, and causes a great deal of trouble on account of being used mostly on cars with wooden truck bolsters, which become sagged in the center; as the center plates are made of cast iron, they will not bend to suit the depression of the bolsters, consequently a great many of them break, which causes them to cramp and makes the truck curve very hard, causing an undue pressure on the wheel flanges. The other extreme is the very small plate, with but two bolts holding it; these bolts become loose and allow the plates to shift back and forth until they are worn down into the truck bolster, and up into the body bolster, if of wood, causing an additional weight on the side bearings. In this case, when the car strikes a curve the friction is so great between the side bearings that they will not move sufficiently to allow the truck to curve as it should, but, instead, the truck is forced to cramp itself around the curve, and, upon reaching the straight track, it does not come back to its original shape, but will go for miles with the flanges grinding.

To make this matter worse, there are a great many cars built that have no means whatever of holding the trucks square, and, as they are subjected to very heavy strains when rounding curves and running over frogs

\*Extracts from a paper by Mr. C. C. Borton, presented before the Pacific Coast Railway Club.

and switches, they often get badly out of shape, and as long as the truck runs in this condition, two of the wheels will grind against the rail until a reverse curve is reached, when it is almost sure to go to the other extreme, and grind the rail on the opposite side of the track.

The side-bearing subject, which has been brought up and discussed by a number of mechanical bodies, is considered to be responsible for a good share of the sharp flanges. It is estimated that not less than 60 per cent. of sharp-flanged wheels removed can be laid to defective or badly constructed side bearings, or from cars having too great weight on the side bearings caused by weak body or truck bolsters. From 75 to 90 per cent. of the freight cars have the side bearings tight together.

One of the most difficult questions is that no one is able to give any kind of estimate as to the weight upon the side bearings of a car. If they are together, there is no way of telling whether there is 10 or 10,000 lbs. resting on them, and this question is one that causes a great amount of worry to foremen and inspectors for this reason. The heads of the car and locomotive departments realize what it means to have these cars

#### Corrosions and Cracks in Locomotive Boilers.

Mr. Desgeans, Engineer in the Epernay shops of the Eastern Railroad of France, has published recently in the *Revue Générale des Chemins de Fer* an important article on "Boiler Defects and Failures," which we reproduce at length.

The observations were made especially on iron boilers, but observations were collected on two boilers made of puddled steel plates and 36 fireboxes of cast steel plates which agree generally with the observations on the iron plates, except that the steel plates seem to have some small advantage, particularly in the matter of pitting. The two steel boilers referred to were torn down in 1892 and 1893. Of the 36 steel fireboxes 30 are still in service. Since 1891 steel plates have been used exclusively on this railroad for the shell of the boiler, but it is considered that the number of these steel boilers is still too small and their service has been too short to make it desirable to include their results in this report. Speak-

chanical action and are found in those parts of the boiler subject to flexure, the result of changes of temperature, but the strain on the sheets submitted to the steam pressure and the violent shocks to which the construction is subject in use have some influence, and it may happen that the original work in the shop has induced this kind of deterioration.

In order to group in an orderly way the various defects observed they have been divided into classes as follows:

#### I.—BOILERS OF IRON OR STEEL.

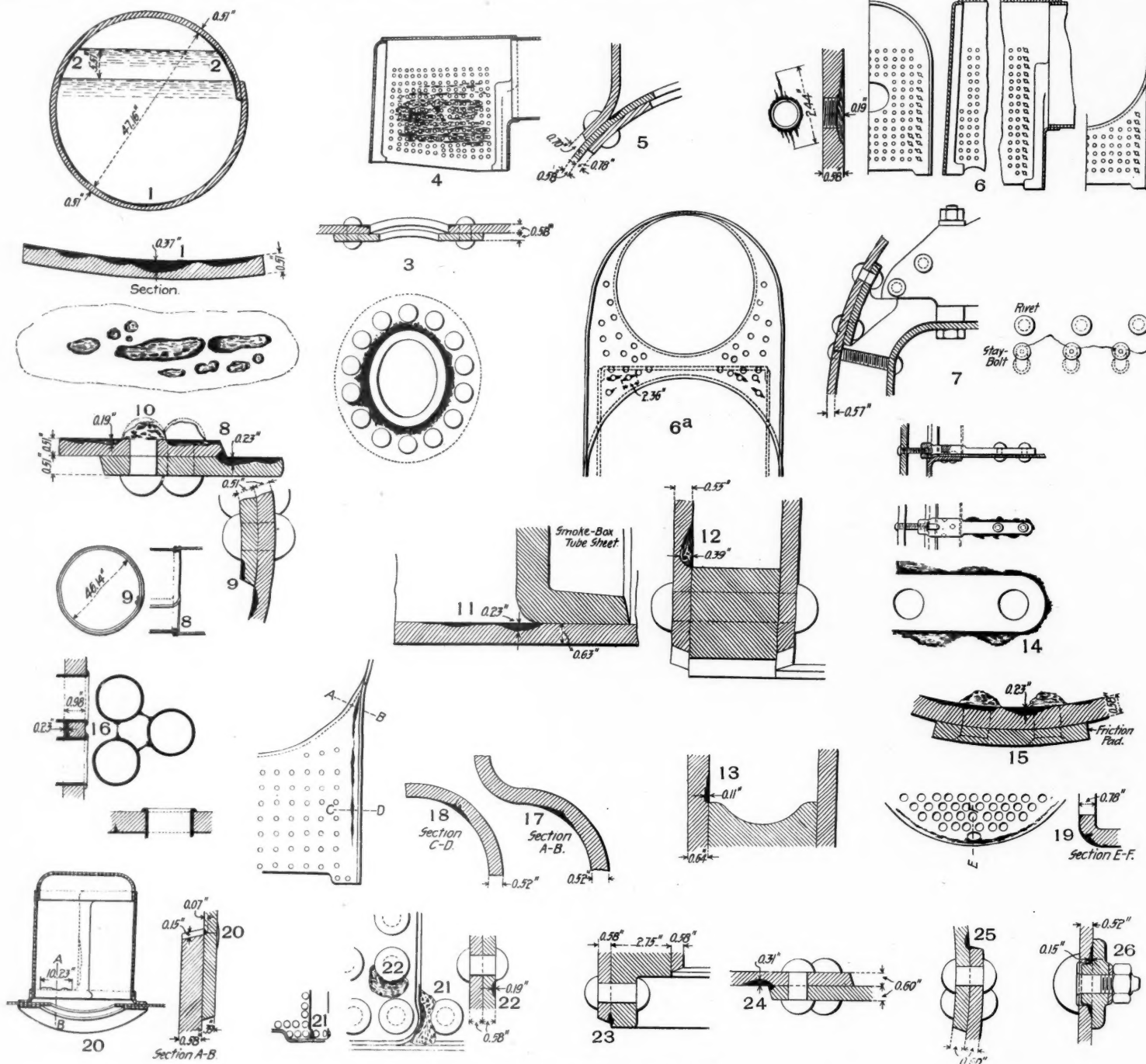
##### Sub-class 1. Interior corrosion.

- (a). Corrosion due exclusively to chemical action.
- (b). Corrosion and cracks due to mechanical action helped by the chemical action.

##### Sub-class 2. Exterior corrosion.

#### II.—COPPER FIREBOXES.

- Sub-class 1. Corrosion and cracks on the water side.



Corrosions and Cracks in Locomotive Boilers.

running, and consequently give strict orders to their different subordinates, and they in turn issue instructions to their foreman and inspectors, to allow no car which shows signs of resting hard on the side bearings to leave their station, but to have all such cars sent to the repair track and shimmed up sufficiently to give them a proper clearance. The inspector may find a number of such cases in the train, and so he goes over all the trains, tagging this one, and letting that one go. The outcome is that during the day he tags a number of cars to be raised, along with some having other defects. The next morning, when the report of cars tagged comes into the office, and they see such a number of cars marked, everyone is after the inspector, and the next day it is harder than ever to know which car to run and which to cut out.

The principal point which I wish to make is that there is no part of a car which should be more carefully watched than this flange wear, and as the running of this car, or the shopping of that one, can not be governed by an iron-clad rule, the inspector or foreman who is called to pass upon such cars should be a man of good training and judgment to be able to handle his work in proper shape.

ing generally, it is found in all locomotive boilers, after taking out the tubes and thoroughly cleaning the plates, that there is more or less pitting and corrosion, and these same defects are found in the tubes.

Most of the corrosion seems to be due to chemical action quite independent of the mechanical action of the plates. The plates show a series of cavities of a lenticular form, the diameter of which may be from  $\frac{3}{4}$  in. to 1 in., and the depth from  $\frac{1}{4}$  in. to  $\frac{1}{2}$  in., or even more. These pits may be distinctly separated one from another or they may run together. The cavities are filled with a brownish powder, mostly oxide of iron. It appears that the corrosion should be attributed to the chemical action of the hot water and to the salts or gases (as carbonic acid or oxygen) dissolved in water. The corrosion seems to be less in surfaces smoothly finished while surfaces originally porous, or rough, favor corrosion.

Other corruptions are caused more especially by me-

##### Sub-class 2. Corrosion and cracks on the fire side.

#### III.—TUBES.

These defects are described in the numbered paragraphs which follow, and are shown more or less completely in the engravings numbered like the text.

##### I.—Boilers; sub-class 1; interior corrosion; (a), corrosion due exclusively to chemical action.

1. Defects found in the lower part of the barrel of the boiler, extending over considerable area, with a few isolated pits of no importance scattered outside of that area. Cause, destructive action of the water or of the elements dissolved in the water. Result, weakening of the sheets, generally not serious, but sometimes necessitating reinforcement or replacement.

2. In some cases (not so common) the corrosion extends to the highest water line, and in these cases the corruptions are more marked in the region between the low water line and the high water line, and there is generally a zone below the low water line free



from these marks. The causes and consequences are the same as above.

3. Corrosion around the wash-out holes in the lower part of the barrel of the boiler or the sheets surrounding the firebox. At these points there may be light scaling, permitting oxidation by the air, or the use of tools may cause abrasion. These holes are found at the lowest part of the boiler. The results are light corrosion necessitating reinforcement.

4. On the side sheets, corrosion of great extent but generally shallow, caused by the chemical action of the water, resulting in weakening of the shell, generally not serious.

5. At the bottom of the dome shallow corrosions

less in 39 boilers of a certain class. Causes and results as above.

7. There have been a few cases like this of cracks along the upper horizontal row of staybolts in the outer shell of the firebox. These fireboxes have transverse crown bars resting on lateral brackets. Cause, pressure of the crown bars on the brackets, tending to cause the plate to pivot around the first line of staybolts, aggravated by the pressure of the steam, also aided by the bending of the staybolts from the expansion and contraction of the firebox. Result, establishing a line of rupture necessitating reinforcement or replacement.

8. Defects of this class (along the circumferential

tion due to the movement of the tube sheet under the action of the tubes themselves. Result, weakening necessitating reinforcement or replacement.

12. Corrosion near the upper surface of the firebox ring caused by bending due to steam pressure, changes in temperature and the expansion of the firebox itself, helped by the chemical action of the water. Result, weakening of the sheet which necessitates reinforcement, and in certain cases replacing entirely the lower part of the sheet.

13. About the door of the firebox. This is rare. Causes and results as above.

14. On the surface of the sheet around the stays of the firebox tube sheet. Cause, fatigue of the plate in consequence of the pull of the stays because of the movement of the tubes; also chemical action of the water always greatest in the lower part of the boiler. Result, weakening of the plate, replacing of the sheet or the application of stays of special form to act as reinforcements.

15. Over the support of the boiler above the expansion pad at the front. Sometimes these corrosions are found when the rest of the barrel of the boiler is free. Cause, tension due to the resistance to motion of the boiler and to the lateral shocks of the structure, also chemical action of the water. Result, weakening and reinforcement.

16. Interior cracks of the tube sheet of the smokebox. Cause, movement due to the thrust of the tubes, also chemical action of the water. Result, fracture of the plates and the application of figure-of-eight pieces, or of screw threaded plugs, or replacement of the plates.

17. Corrosion in the upper part of the plates forward of the firebox. Cause, flexure, expansion and contraction resulting from the internal pressure and changes of temperature, tendency to deformation under the action of the pressure because of joining a cylindrical part with a plane part; fatigue of the sheets because of the difficulty which the boiler finds in expanding and of the thrust of the barrel of the boiler on the firebox, always somewhat restrained by its supports. Result, weakening of these parts, and reinforcing or replacing plates.

18. Corrosion in the vertical angles of the plates before and behind the firebox. Causes and results as above.

19. Around the edges of the tube sheet of the smokebox. Causes, flexure from internal pressure and from the thrust of the tubes, also chemical action of the water in the lower part. Result, fracture, the application of reinforcements or replacement.

20. Transverse cracks at the base of the steam dome. Cause, purely mechanical from misuse during construction.

#### I.—Boilers. Sub-class 2. External Corrosion.

21. The lower part of the side sheets near the firebox ring and around the heads of rivets. Caused by strain in the joints or defective rivets. Result, corrosion generally insignificant. It is generally enough to clean away the rust and perhaps to replace a rivet.

23. At the lower edge of the side sheets. Cause and results as above.

24. Exterior corrosion of the lower part of the barrel of the boiler in the circumferential joints. Cause, not only expansion and contraction under changes of temperature, but corrosive action of the water after a leak has begun.

25. Corrosion along the longitudinal joints. Causes as above. The corrosions are always less frequent and less accentuated than in the circumferential joints, and cleaning and light calking is generally enough to correct them.

26. External corrosion around the plugs and wash-out holes of the barrel of the boiler and the outer walls of the firebox. Cause, leaks or mechanical defects. Remedy, reinforcements or new parts.

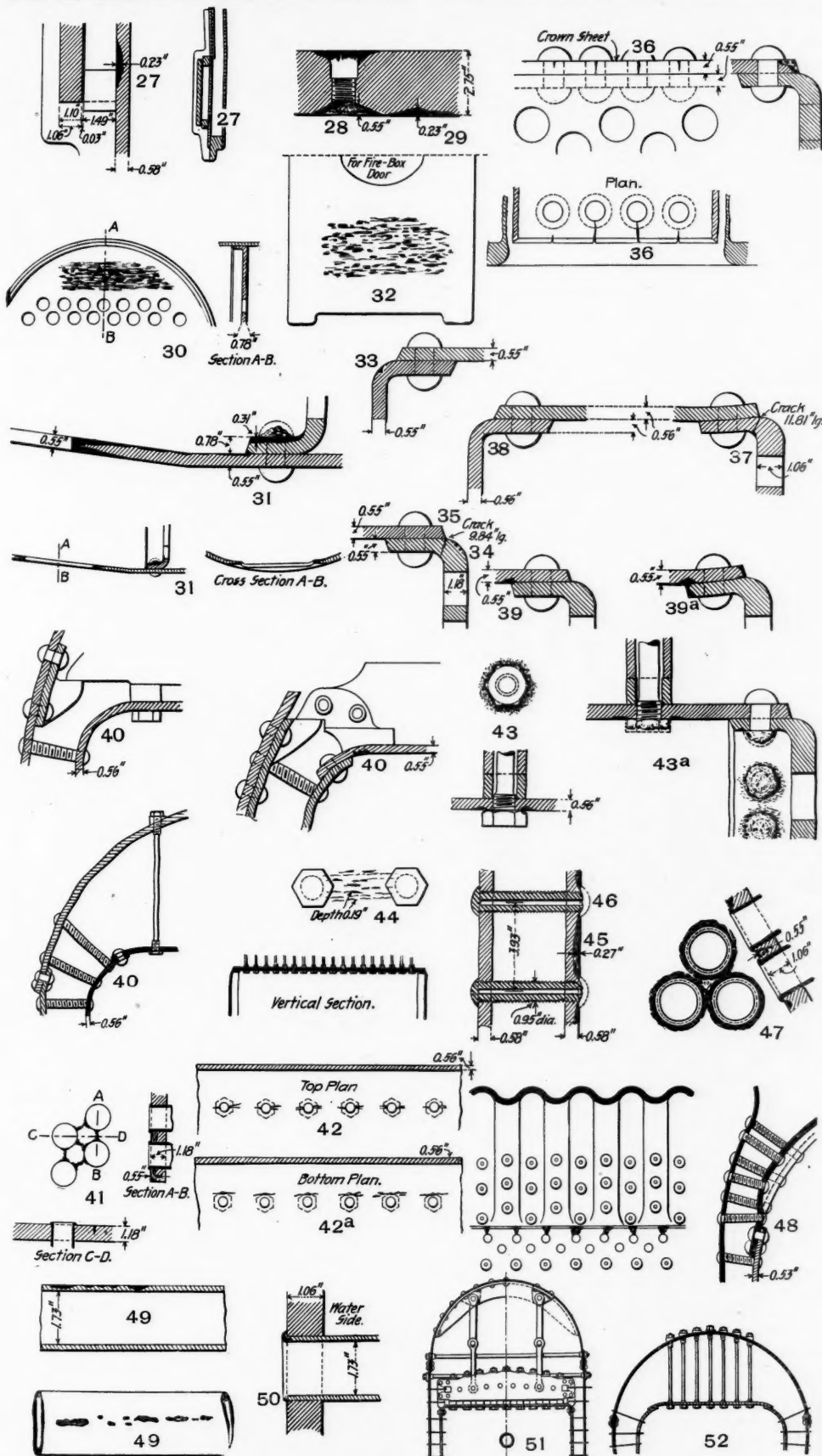
27. This defect is a consequence of dampness due to the deposit of ashes and oil, or leaks in staybolts or rivets. The results are generally not important, and a piece applied at the corroded part and attached to the solid part is usually sufficient.

28. Around the wash-out holes of the firebox frame. Cause, want of care on the part of those responsible for the maintenance of the engine. These corrosions are greater when the internal corrosions themselves are greater, in consequence of the more corrosive quality of the water. Usually these are without importance in themselves, but when as much developed as shown in the sketch they indicate that other parts of the frame are attacked.

29. In different parts of the firebox frame, caused by fatigue due to pressure and also to expansion and movement of the whole structure in running, and to defective calking. Generally it will suffice to apply and weld pieces, but in the more serious cases the frame must be replaced.

30. General corrosion of the upper part of the tube sheet of the smokebox due to vapor and the deposit of soot, generally of little importance.

31. General or local corrosion of the sheets, rivet heads, etc., in the smokebox. The edge of the sheets, as shown here, is often reduced to the thickness of a knife blade and cracks occur on the edge. Chief causes, leaky tubes and general dampness in the smokebox, aggravated by the presence of burning



Corrosions and Cracks in Locomotive Boilers.

which have been discovered only exceptionally on the Eastern Railroad, where superimposed domes have been used since 1878. The cause, chemical action of condensed steam. The results generally not serious.

I.—Boilers; interior corrosion and cracks; (b) due to mechanical and chemical action.

6. Defects about the staybolts and generally in the outside vertical rows. Cause, mechanical movement and chemical action. Result, the establishing of a line of rupture which may necessitate replacing the plates or the application of reinforcements.

6a. Cracks as shown have been discovered more or

seams of the barrel) appear to have the same origin and result as No. 7.

9. Corrosion along the longitudinal seams of the barrel of the boiler and especially when the joints are at the lower part of the boiler. The cause as above. These corrosions are not often seen and are generally of small importance.

10. Corrosion of the rivets in the barrel; quite frequent; cause as above. Result, replacement if these only are corroded.

11. Corrosion of the lower part of the barrel of the boiler close to the smokebox tube sheet. Cause, action of the water and very probably mechanical ac-



cinders. Result, weakening of the parts. Remedy, reinforcement or replacement.

32. General but shallow corrosion of the back head of the boiler. Cause, dampness as a consequence of deposits of dust and oil, and sometimes of leaky attachments.

#### II.—Fireboxes. (1) Corrosions and cracks on the water side.

Corrosions are rare in copper fireboxes in those parts covered with water. All corrosions of copper fireboxes on the water side appear especially to have mechanical origin, and most of the defects are cracks. Certain mechanical actions, which are the important causes of corrosion in plates of iron or steel, cause none in plates of copper in identical situations.

33. Cracks in the upper part of the back plate of the firebox on the curve. Cause, bending under expansion and contraction of the plate itself and of the crown sheet. Result, weakening of the walls, necessitating reinforcement or replacement.

34. Similar cracks on the tube sheet. Cause and consequence, the same. Motion aided by the thrust of the tubes.

35. Cracks along the line of riveting. Cause and consequence as above.

36. Cracks in the crown sheet following the lines of rivets, especially along the joint with the tube sheets.

#### II.—Fireboxes. (2) Corrosion and cracks on the fire side.

37. In the vertical and horizontal angles of the front sheets of the firebox. Cause, bending under the effect of expansion and contraction, and also from the thrust of the tubes.

38. Similar cracks but smaller and less frequent in the horizontal and vertical angles of the back plates. Causes, the same.

39. Corrosion along the lines of riveting and especially at the joint with the tube plate. These are caused by, or much aggravated by, leaks and are sometimes very important, as in 39a. The movement under expansion and contraction accelerates the leaks and then action of the water takes place.

40. Cracks in the horizontal angles of the firebox shell, generally much less notable when the shell is of one piece than when of three pieces. Causes and consequences, obvious.

41. Cracks in the tube sheet. Cause, movement of the tubes. Result, application of pieces in figure-of-eight, or screwed plugs.

42. Corrosions and cracks about the crown bar bolts. Causes, fatigue of the metal under motion, also insufficient washing and incrustation, also low water.

42a. In certain cases the cracks are not along the axis of the bolt holes but at one side.

43. Corrosion around the heads of the crown bar bolts. Causes, the same as above.

43a. Corrosion of the heads of these bolts and of the rivets. Occurring under the action of coke containing some sulphur. Seen in engines burning special qualities of coke.

44. Transverse cracks in the crown sheet between the bolts. This case is quite rare. Caused by scale which interferes with the transmission of the heat and causes overheating of the sheet.

45. Wear of the firebox sheets between the staybolts. It is well to notice the wear observed in the lower part of the firebox near the fire and a little above. This is found where coke containing more or less sulphur is burned, also where very fine coal is used, which is wet down into a sort of paste, and it is probable that the water helps oxidation of the walls of the firebox.

46. Wear around the heads of the staybolts and of the staybolts themselves. The causes noted under 45 act here, also defective work in putting in the staybolts has something to do with it, also scale lowering the conductivity.

47. The same kind of corrosion is seen on the tube sheet around the tubes. To the causes given above may be added leaks.

48. A special case seen in 12 fireboxes on engines of a certain class. These had copper side sheets and front and back sheets with a crown sheet of corrugated steel. Along the joint of the side sheets with the crown sheet occurred a series of deep corrosions affecting the copper. Sometimes the metal was almost entirely consumed. Cause, in some degree, difference in expansion of the two metals, also action of the water coming from leaks and probably also galvanic action. All of these fireboxes have given place to fireboxes made entirely of copper.

#### III.—TUBES.

Tubes of brass having never been subject to corrosion in the parts in contact with water, the observations which follow refer exclusively to tubes of iron or of soft steel, the use of which has spread more and more on the lines of the Eastern Company.

49. Cause, chemical action of the water. The corrosion seems to depend somewhat upon the first state of the tubes themselves, roughly finished surfaces developing rapid corrosion. Scale also helps, as does the motion of the tubes under variations of temperature. The results are local leaks.

50. Corrosions of the beading on the fire side of the firebox, which corrosions are observable in steel

tubes as well as in those of brass. The cause is action of the water coming from leaks which may arise from the motion of the tubes, from defective mechanical work, from the friction of the products of combustion in the firebox, and in some special cases from the use of coke fuel.

#### CONCLUSIONS FROM THESE OBSERVATIONS.

In designing a locomotive boiler, we must facilitate as much as possible the expansion and contraction of the various parts. Curved angles should have long radii. The crown sheet, especially at the tube end, should be able to move freely, and for small fireboxes probably longitudinal crown bars would be preferable. For large fireboxes, the Belpaire design is a good one, or we may use transverse crown bars resting directly on the sides of the firebox (Fig. 51), which seems to be preferable to the method shown in Fig. 52. The French companies are using the Belpaire design more and more.

We may also diminish the importance of expansion and contraction to some degree by using different material, which has been the case in the replacement of tubes of brass by those of steel.

We should avoid imposing upon the plates bending strains, the amount of which we cannot know quite exactly. For instance, transverse crown bars carried by brackets riveted to the outer shell have been shown to be dangerous.

Of course strong joints and solid riveting are desirable, and hydraulic riveting is recommended. The design should be, so far as possible, such that the movement of the plates will not produce folds or the commencement of cracks, and in this respect perhaps steel plates are preferable to those of iron.

Steel plates and tubes with smooth, well finished surfaces, should be used.

Obviously, it is desirable to use good boiler water, and it is important to look out for local leaks, and it seems to be desirable to take off the boiler jackets at periodical intervals to look for exterior corrosions.

Sudden changes of temperature should be avoided so far as practicable. Firing should be carefully watched, the firebox kept clean, the blower used as little as practicable, the fire allowed to die out slowly, and the boiler should not be washed out until it has become reasonably cool. Sulphurous fuel should be avoided. Boilers retired temporarily from service should be carefully emptied and dried.

It goes without saying that all these precautions are peculiarly necessary in boilers carrying high pressure.

#### A New Air Driven Hammer.

The International Pneumatic Tool Company, Monadnock Block, Chicago, has been formed to make pneumatic hammers, the construction of which will be readily understood from the accompanying engravings. The valve is an annular ring in the upper part of the body of the hammer, and the piston is shown in both the upper and lower positions. The air supply is controlled by the thumb lever in the usual manner and enters the chamber above the valve. When the piston is in the upper position as shown, the valve is open to admit air above the piston extension, the object of the extension being to cause the piston to move slowly until the full piston area is exposed. When the annular chamber of the piston comes opposite the port, A, air is admitted to the lower side of the valve, and on account of the greater area causes it to move upward, so as to close the admission ports and open the exhaust ports. From that point the momentum of the piston carries it to the end of the stroke. When in the lower position, air is admitted through the restricted passages, B, to the under side of the piston, causing a comparatively slow return. When the piston reaches the upper position the port, C, is uncovered, allowing the air below the valve to exhaust below the piston, so that the valve is again moved to its lower position and the same operation is repeated. It may be noted that after the piston extension enters the valve block compression takes place, forming a cushion at the end of the stroke.

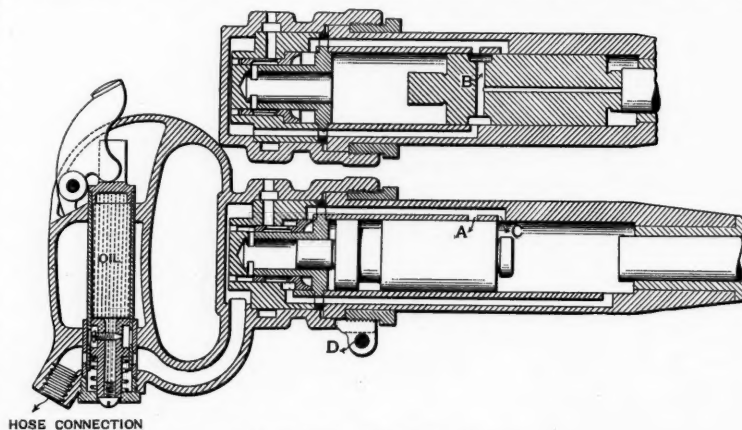
It will also be seen that an oil chamber is formed in the hammer handle from which oil is fed slowly when the hammer is working; the oil entering along with the air and reaching all the moving parts. Another feature is the way in which the barrel is joined to the body of the hammer. The body is threaded to receive the annular nut shown, and when in place the nut is clamped by the transverse bolt, D.

The new company will be under the management of Messrs. B. E. Tilden and O. J. Fellows.

#### Steel in a Blacksmith Shop.\*

Steel working is the most important branch of blacksmithing and there is not one smith in twenty fully competent in this particular branch. Most smiths have notions at variance with the laws governing steel, and for the reason that they are not close observers of cause and effect, lose sight of the importance of the necessity of working intelligently and planning wisely. The toolsmith should know the carbon points of steel he is working. For example, if he has been in the habit of making milling cutters out of steel containing 125 carbon points he knows just what degree of heat is suitable for the right temper. If he should, perchance, receive a piece of steel with only 110 carbon points he would get the milling cutter too soft, yet he could in either case make a satisfactory tool if he knew the carbon points. Purchasing agents should bear this in mind, and furnish the mechanical department what it calls for. Find out what carbon points are suitable for the purpose required, and if you will change, notify the mechanical department, or else you will confuse the temper, for he cannot discern the difference by inspection.

The carbon points as used in the St. Paul & Duluth shops with relation to the various purposes for which our tools are required, are as follows; a point in this case being one-hundredth of one per cent. of carbon: One hundred and fifty carbon points, suitable for lathes, planes, boring car wheels, etc.; 135 carbon points suitable for large lathe and planer tools, me-



The "Tilden" Pneumatic Hammer.

dium size dies, etc.; 125 carbon points suitable for taps, reamers and drills; 115 carbon points suitable for screw cutting dies, chisels, punches and milling cutters; 105 carbon points suitable for cold chisels, punches, dies, large taps, milling cutters, small shear knives; 95 carbon points suitable for large punches, shear blades, large dies and some blacksmith tools; 85 carbon points for stamping dies, hammers, cold sets, track chisels and smith tools; and 75 carbon points for swedges, flatters, cupping tools and blacksmith tools generally. In ordering steel give the temper, or state the purpose for which the steel is to be used. Once in a while the steel worker will complain that the steel varies and the results are not always the same; the trouble is that he gets hold of the wrong bar, or gets the bars mixed by mistake.

The carbon points given are obtained from average results, but must not be adhered to strictly, as conditions may necessitate a deviation. Take a chipping chisel containing 125 points, such as we use in the tool room for fine and delicate work, and for comparison we will take a boiler maker's chipping chisel containing 105 carbon points; now, here are conditions that cause a large variation, a difference of 20 carbon points in the two chisels. Again, a lathe tool for turning hard tires, tool steel, or for hard roll turning will require 150 carbon points, whereas a lathe tool for turning bolts or soft material will require from 125 to 135 carbon points. The speed of the machine and the nature of the material to be cut are factors in determining carbon points, and there are no hard and fast rules.

Heating and Working.—It is very discouraging to the steel maker to find that after all his care and expense, his product is abused in heating after it leaves the mill. The proper heat is learned only from experience. If the toolsmith, in forging a tool, were to reduce a piece of steel from 6 in. to 3 in. in diameter, he would use a higher heat than in reducing a piece of steel from 2 in. to 1½ in. in diameter. In the first or larger piece he heats up to a coarse grain, but the hammering to bring about this reduction refines the steel and no harm is done. If the second or smaller piece is heated up to the same high heat as the first piece, you start with the same coarse grain as in the large piece, and a reduction of only ½ in. in diameter under the hammer is insufficient to hammer-refine the steel; besides the larger piece will hammer-refine and reduce in heat at the same time. Not so with the smaller

\* From a paper by Mr. G. F. Hinkens, foreman blacksmith of the St. Paul & Duluth RR., read at the September meeting of the Northwest Railway Club.



piece; it will receive no hammer-refining and the high heat will leave its structure coarse.

I wish to call attention to the use of old axle steel for blacksmith shop tools, when only the factor of battering and abrasion is to be taken into account, such as flatters, fullers, sledges and sets, and all tools that call for from 60 to 70 carbon points in crucible steel. Of course, we know that axle steel containing from 40 to 45 carbon points will not ordinarily withstand battering, but we have experimented, and with good success, in utilizing some of our old steel axles for the above mentioned tools. Our method is simply to harden the head, and on such tools as flatters and sets to harden both the head and face. The process merely involves a determination of the proper temperature which can be permitted for hardening in water, and I find that some caution is necessary to obtain the desired result. If the heat is too low, the temper in the tool will be too soft to withstand battering, and again, if the heat is too high it will hasten the destruction of the tool by causing the head to break away, and for the reason of not knowing the exact carbon points, there is no means of absolutely determining the right heat, and therefore our only guide is to calculate from its action under the hammer. Axle steel containing 45 carbon points should be drawn or tempered to a second blue. This will change the steel from a loose to a combined condition, thus making the working parts, or the parts that receive the blow, more compact. We have in use in our shop tools made from old axle steel that are just as serviceable for the purposes mentioned as any crucible steel of 60 or 70 carbon points.

#### Schenectady New Double-End Locomotives.

The Schenectady Locomotive Works recently built for the Dominion Coal Co., Ltd., Cape Breton, Nova Scotia, a double-end mogul and a double-end consolidation, an engraving of the former of which is shown herewith. These engines were designed to conform to specifications of the Dominion Coal Company, and were built to meet the particular conditions of service on the company's railroad.

The consolidation weighs 239,000 lbs. and the mogul 172,000 lbs. The cylinders of the former are 22 in. x 28 in., and of the latter 19 in. x 26 in. The working

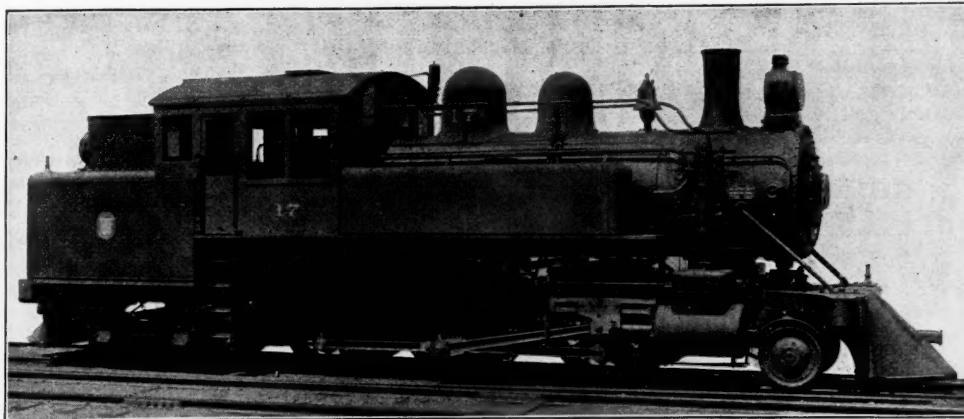
Working pressure	200 lbs.
Material of barrel and outside of firebox	Carbon steel
Thickness of plates in barrel and outside of firebox	$\frac{1}{2}$ in., $\frac{3}{4}$ in., $\frac{1}{2}$ in. & $\frac{1}{4}$ in.
Horizontal seams..Butt joint sextuple riveted, with	welt strip inside and outside
Circumferential seams	Double riveted
Firebox, length	114 in.
" width	41 $\frac{1}{2}$ in.
" depth	Front, 70 $\frac{1}{2}$ in.; back, 67 $\frac{1}{2}$ in.
" material	Carbon steel
" plates, thickness	Sides, $\frac{3}{4}$ in.; back, $\frac{1}{2}$ in.
" " crown, $\frac{3}{4}$ in.; tube sheet, $\frac{1}{2}$ in.	
" water space..Front, 4 in.; sides, 3 $\frac{1}{2}$ in.;	back, 3 $\frac{1}{2}$ in. x 4 in.
" crown staying	Radial stays, 1 $\frac{1}{2}$ in. diam.
" stay bolts	1 in. diam.
Tubes, material	Charcoal iron No. 12
" number of	348
" diam.	2 in.
" length over tube sheets	13 ft. 10 in.
Fire brick, supported on	Studs
Heating surface, tubes	2512.55 sq. ft.
" firebox	176.92 sq. ft.
" total	2,689.47 sq. ft.
Grate	33.21 sq. ft.
" style	Rocking
Ash pan	Sectional, dampers front and back
Exhaust pipes	Single, high
nozzles	5 $\frac{1}{2}$ in., 5 $\frac{1}{2}$ in., 5 $\frac{1}{2}$ in. diam.
Smoke stack, inside diameter	16 in.
top above rail	14 ft. 9 $\frac{1}{2}$ in.
Boiler supplied by—Two Hancock Inspirators, Type A,	size No. 9 R. & L.

#### Tender.

Wheels, number of	4
" diam.	28 in.
Journals, " and length	5 in. diam. x 9 in.
Tender trucks..4 wheel center, bearing swing spring	
bolster carrying back end of engine	
Water capacity	4,200 U. S. gallons
Coal	4 tons
American steam brake on all drivers and on 4 wheel	
truck. Two headlights; two Crosby 3 in. muffled safety	
valves; magnesia lagging on boiler and cylinders; Leach	
sand feeding apparatus; one No. 3 Star 6 in. chime	
whistle.	

The descriptive specifications are about the same for the two engines. Below are given some of the leading dimensions and weights of the mogul:

Weight in working order	172,000 lbs.
on drivers	122,000 lbs.
Wheel base, driving	13 ft. 2 in.
" " total	32 ft.
Diam. of cylinders	19 in.
Stroke of piston	26 in.
Outside diam. of first ring	62 in.
Working pressure	180 lbs.
Thickness of plates in barrel and outside of firebox.	$\frac{1}{2}$ in., $\frac{3}{4}$ in., $\frac{1}{2}$ in. and $\frac{3}{8}$ in.
Firebox, length	90 in.
" depth	Front, 65 $\frac{1}{2}$ in.; back, 56 $\frac{1}{2}$ in.
" crown staying	Radial stays, 1 in. diam.
" stay bolts	$\frac{1}{2}$ in. and 1 in. diam.
Tubes, number of	236
length over tube sheets	12 ft.



Double-End Mogul, Dominion Coal Co., Cape Breton, N. S.

steam pressure of the consolidation engine is 200 lbs. and of the mogul 180 lbs. The descriptive specifications for the consolidation are as follows:

#### General Dimensions.

Gauge	4 ft. 8 $\frac{1}{2}$ in.
Fuel	Bituminous coal
Weight in working order	239,000 lbs.
" on drivers	170,000 lbs.
Wheel base, driving	15 ft.
" " rigid	15 ft.
" " total	36 ft. 3 in.

#### Cylinders.

Diam. of cylinders	22 in.
Stroke of piston	28 in.
Horizontal thickness of piston	5 $\frac{1}{2}$ in.
Diam. of piston rod	3 $\frac{1}{2}$ in.
Kind " " packing	Cast iron
" " rod packing	U. S.
Size of steam ports	18 in. x 1 $\frac{1}{4}$ in.
" exhaust ports	18 in. x 2 $\frac{1}{4}$ in.
" " bridges	1 $\frac{1}{4}$ in.

#### Valves.

Kind of slide valves	American balanced
Greatest travel of slide valves	5 $\frac{1}{2}$ in.
Outside lap	$\frac{3}{4}$ in.
Inside " "	$\frac{1}{4}$ in.
Lead of valves in full gear	U. S.
Kind of valve stem packing	U. S.

#### Wheels, etc.

Diam. of driving wheels outside of tire	55 in.
Mat'l " " centers..Main, cast steel, inter. F. & B. steered cast iron	
Tire held by	Shrinkage
Driving box material..Main, cast steel, inter. F. & B. steered cast iron	
Diam. and length of driving journals..Main only 9 in. diam., 8 $\frac{1}{2}$ in. diam. x 10 in.	
" " " main crank pin journals, (Main side 7 $\frac{1}{2}$ in. x 5 in.) 7 in. diam. x 6 $\frac{1}{2}$ in.	
" " length of side rod crank pin journals, (F. & B. 5 in. x 3 $\frac{1}{2}$ in.) inter. 6 in. diam. x 4 $\frac{1}{2}$ in.	
Engine truck, kind	2-wheel swing bolster
journals	6 in. diam. x 10 in.
Diam. of engine truck wheels	30 in.
Kind	Plate

#### Boiler.

Style	Straight
Outside diam. of first ring	72 in.

Heating surface, tubes	1,472.49 sq. ft.
" " firebox	125.43 sq. ft.
" " total	1,597.92 sq. ft.
Grate	26.23 sq. ft.
Water capacity of tender	3,700 U. S. gallons
Coal	5 tons

#### Railroad Engineering at the University of Illinois.

We have just received from the Railway Engineering Departments of the University of Illinois, some information regarding the course as outlined in railroad mechanical engineering at that University. The undergraduate course in railroad engineering, leads to the degree of B. S. and graduate instruction and investigation in this department have been provided, leading to a second degree. Three leading railroads of the State have promised their co-operation in the work of the department, and the Department of Civil Engineering at the University already furnishes special instruction relating to construction and maintenance of way. In the new course just outlined special attention will be given to the problems of motive power and machinery, including construction, design and the working of locomotives and rolling stock, as well as all tests of fuel, water supply, materials and supplies.

There are eight distinct courses covering some theoretical but more practical work. For example, in course 5 compressed air in railroad service will be studied. This will include such topics as the construction and operation of air brakes. The air brake instruction cars of the Illinois Central and the Cleveland, Cincinnati, Chicago & St. Louis railroads, which make frequent stops at these points, will be used in connection with the course. Also in this course the students will study various signal systems and meth-

ods of car heating and car lighting. Courses 4 and 8, which will be under the direction of the Railroad Engineering Department, and Mr. J. A. Barnard, General Manager of the Peoria & Western Division of the Big Four Railroad, have been outlined as follows:

1. Calibration of oil cylinder of dynamometer.
2. Experiments to determine relative resistances of the same cars, loaded and empty: (a) On level. (b) On curves. (c) On grades.
3. Experiments to determine relative resistances of different loads at the same speed.
4. Experiments to determine relative resistances of the same load at different speeds.
5. A series of tests to determine the comparative fuel economy of the "consolidation" and "ten-wheel" locomotives.
6. A series of tests to determine the comparative values of different fuels with either the "consolidation" or "ten-wheel" locomotives.
7. Completion and installation and trial of track inspection apparatus. This is a new form of track inspection apparatus, now being made. The mechanical principles upon which its action depends are the same as those which are used in the dynamometer now in operation. The deviations from gage and from surface alignment cause lateral and vertical motions in a pair of wheels hung, on a divided axle, midway between the main trucks of the dynamometer car. These motions are transmitted to the pistons of hydraulic cylinders which are placed on the wheel axles and in communication with the boxes respectively.

These cylinders are in hydraulic communication with other smaller cylinders whose piston-rods carry the marking points which make their record on a moving chart, driven off the main axle.

Upon this chart are recorded, simultaneously with the records of gage and surface alignment, the speed, grade, curvature, time, and the position of mile posts.

8. Examination of water-supply apparatus on the Cleveland, Cincinnati, Chicago & St. Louis Railway.

This will include:

- (a) Examination and report of local conditions.
- (b) Estimates of cost of all forms of present installation.
- (c) Series of tests to determine cost of operation.
- (d) Estimates of cost of maintenance and repairs.
- (e) Report on the relative efficiency of the different plants.
- (f) Analyses of water from various supply tanks.

Mr. Edward C. Schmidt, Instructor in Railway Engineering, is in charge of the work which is under the general supervision of Prof. L. P. Breckenridge.

#### Progress in Signaling.

By H. M. Sperry.\*

Great progress has been made in the practice of signaling, and the present year has been a most active one in signal construction. The signal departments of our railways are growing, and a number of new signal departments have been created on railroads heretofore without them.

In March, 1897, in a paper before this Club, I summed up some of the questions of interest to signal engineers. Some of these problems are much nearer solution than they were in 1897. A green light is now pretty generally conceded to be the proper one for the clear indication; opinion differs, however, as to the proper color for the distant signal. The New York, New Haven & Hartford has made a strong effort to establish yellow as the proper light for distant signals, and a number of roads are anticipating a change by putting up double light semaphore castings in connection with all new work.

There has been little or no change in the practice in regard to derails, except a tendency to make the distance greater between the derail and the fouling point, in order to provide for the increasing speed of trains. In many of the arguments against the use of derails, reference is made to the fact that they are but little used in Great Britain, but the English protect junctions and crossings by means of block signals. The rule is that no two trains shall be allowed to approach a junction at the same time, either upon converging or crossing lines.

It would be very awkward to carry out this system in this country, especially on lines that are without block signals, and even in Great Britain it is frequently a cause for delay, and a modification is permitted. Trains are allowed to approach the junction after notification that the junction is blocked. There can be no question that the derail has proved its efficiency in this country. We must either continue its use or find a method that will give the same measure of safety.

Improvements have been made in switch and lock movements by increasing their stroke. The improvements are not recommended, however, by the American Railway Association. For facing switches in main lines an improvement in facing point locks is still to be desired, so as to make it impossible to lock a switch in the wrong position. Some effort has been made in this direction in Great Britain, but it is the exception in this country. Some of our most progressive lines are now specifying bolt locks on all facing main line switches, whether they be operated by switch and lock movements or locked by facing point locks. This is a step in the right

\*A paper prepared for the Railway Signaling Club and to be read at the Boston meeting, Nov. 14.



direction as a bolt operated by the signal connection is a most efficient check on the proper operation of the switch.

The question of better construction has received considerable attention and many lines have abandoned the use of wooden foundations, substituting cast iron or concrete. As the average life of a wooden foundation does not seem to exceed five years, the increased expense in the use of iron or concrete is more than justified, when the expense of renewing wooden foundations of a plant in service is considered.

There have been some serious failures of pipe connections, and a number of railways are now specifying longer pipe couplings, plugs, and either larger rivets, or four in place of two. As a change of this kind not only means a change in the pipe coupling but in all jaw and other connections, it is to be hoped that our signal engineers will agree upon a form of reinforced coupling that can be used by all. This is a most important detail in signal construction.

The boxing of interlocking connections is being largely done away with, except near stations, etc., where unboxed connections might lead to accidents. Signal wires are now successfully run under ground in small pipes filled with oil.

The subject of proper maintenance is receiving increased attention. Regular inspection more or less frequent, dependent upon the amount of wear and tear to which such apparatus is subjected by reason of the traffic; this, supplemented by prompt repairs, the whole work being in the hands of competent men, means satisfactory results. It is to be regretted that this is not generally recognized, inspections not being made in a systematic way. As a result, repairs are frequently neglected, or in some cases inspections are omitted entirely, and repairs only made after trouble is reported. Some effort should be made toward a uniform system of maintenance, and the club could engage in no better work than to prepare a code of rules, forms, etc., both for interlocking and block signals.

For large installations, such as terminal stations, power plants are rapidly increasing in favor, and this year marks the completion at Boston of the largest plant in the world; also, the first power plant in Great Britain, taking the place of two mechanical plants.

In automatic signaling the semaphore is rapidly displacing the disc, largely due to the fact that it is now possible to operate the semaphore by electric motor.

There is still a field in signaling that has been little touched upon, and that is signals for electric railways. Numerous accidents on these lines have shown the necessity of block signals. The problem, however, is not an easy one to solve, as on account of the use of electricity for motive power, the operation of automatic signals by track circuits is made impossible. This is a rich field for the inventor. Grade crossings of electric and steam lines are easily cared for by interlocking, and as these crossings are frequently more dangerous than the crossing of two steam railways, proper signals should always be installed.

In order to form an estimate of the amount of work to be done in signaling it is interesting to note that on one of the railways of Great Britain in 1891 there were 1,482 cabins containing 31,500 levers and some 17,000 signals; the wires from the signals alone would reach from Liverpool to New York. A comparison with this country shows that the signaling on this one road was more than all in the entire United States. The field, it will be seen, is a most promising one for our signal engineers. The members of the Railway Signaling Club should not fail to grasp the opportunity to place the signaling of this country on the highest possible plane.

#### The Erie Railroad Gas Engine installation.

In our issue of April 14, 1899, we described the coal and ash handling plants which had just been installed at the Jersey City yard of the Erie Railroad. It may be remembered that the machinery in these plants was driven by gas engines working with illuminating gas. Since then there have been installed two Taylor gas producers about 1,800 ft. from these plants, which were illustrated and described in our issue of Sept. 29. These producers now supply gas for these two engines and also for five others used every day. This installation is interesting in many ways, but more especially because it has been shown from the working of this producer plant that where the right kind of fuel is available, power from producer gas used directly in gas engines costs about one-half as much as the same amount of power produced by a good steam engine and boiler and at about the same first cost.

The producer plant develops about 12,102 B. t. u. per pound of buckwheat coal. The guarantee was for 10,000 on gas having 125 B. t. u. per cu. ft. The tests show that 1 l. h. p. can be developed from this plant on 1.03 lbs. of coal per hour, whereas the guarantee was for 1 1/4 lbs.

The brick building containing the producers is divided by a wall and in the engine room are two No.

12 and two No. 11 Otto engines,\* each of the former of which develops 90 h. p. and the latter 45 h. p. when working with producer gas having 125 heat units per cubic feet. The 90 h. p. engines are connected up so that either can be used to drive a 450 16 c. p. incandescent lamp machine or a 1,120 2,000 c. p. arc machine. The 45 h. p. machines run the coal elevator in the producer plant, one Ingersoll-Sergeant compressor, two Pintsch gas compressors, the pump for salt water for cooling the gas engine cylinders during the summer, and the automatic feed on the producers. The two 400 h. p. Climax boilers in the brick building containing the producer machinery supply during the winter steam for warming the buildings and coaches in the yard and for the producers. During the summer a small auxiliary boiler is used to supply steam to the producers and for working the pump which takes salt water from the river to cool the cylinders of the gas engines. In the winter, the cylinders are cooled by city water which passes into a tank from which it is pumped into the boilers.

The producer plant has an estimated capacity of 471.4 h. p. and Messrs. R. D. Wood & Co. claim it will produce 500 h. p. Before the 8 in. pipe was laid this plant produced gas for engines generating about 270 h. p. A part of the 201 h. p., which the plant is capable of producing above the 270 h. p. but which until very recently was not used, now runs the engines of the ash and coal handling plants (the former being a 19 h. p. and the latter a 36 h. p. engine) and also a 19 h. p. engine in the machine shop. To carry the gas from the producer plant to these engines, about 1,800 ft. of 8 in. pipe was required.

The total estimated annual saving for these three engines, due to the use of producer instead of illuminating gas, was \$2,024 when using buckwheat coal at the producer plant. The cost of running the three engines with illuminating gas was \$16.80 a day; with producer gas \$1.40.

Tests were made June 10 last to determine the capacity of this producer plant and the actual output of one of the engines rated at 90 h. p. The engine



Card No. 9, Spring 202, Rev. 164.

Cards from Lower Cylinder of 90 H. P. Otto Gas Engine at Jersey City.



Card No. 15, Revolutions 166.

test lasted 30 minutes. The cubic feet of gas used during this time was 2,417,455; pressure of the gas in the gasometer, 2 1/2 in. of water, and the calorific power of the gas per cubic foot, 136,273. The following was determined from some of the indicator cards:

No. of Card.	M. E. P.	H. P.
10 (lower cylinder)	54.54	49.163
11	54.944	51.858
12	57.347	52.910
13	54.55	54.62
14	60.80	55.45

Cards Nos. 9 and 15, both taken from the lower cylinder, are shown herewith.

The average horse power for one cylinder from these and other cards was found to be 52.186. The cubic feet of gas per h. p. per hour was (2,417,455 ÷ 2) ÷ 52.186 = 92.6. The horse power of the engine (two cylinders) equals 104.372.

On the basis of the 30-minute test the makers considered it safe to guarantee 52.186 h. p. with 92.6 cu. ft. of gas per h. p. per hour, 21,831.6 (cu. ft. of gas generated per hour) ÷ 92.6 = 235.7 = horse power generated per hour by one of the producers with bird's-eye coal.

The test of the plant was made during the past summer. The test was begun by placing a known quantity of coal in the hopper over the producer. The thickness of the coal bed in the producer was noted and the gasometer was emptied, and as soon as the weighed coal was fed into the producer the test was begun. A simple device was used to take the place of a meter so that the quantity of coal produced could be accurately determined, it being impossible to obtain a meter that would do the work satisfactorily. The producer was shut off and the safety valve on top of the gasometer opened, allowing the gas to escape; after it had emptied the readings from the scales were again taken in order to determine the quantity of gas made and the time noted. As all the gas could not be measured at the time of the test, one of the engines being in operation, a proper allowance was made for the gas thus used. While the test was being made a chemist took samples which show on analyses the following results:

C O (carbonic acid) .....	8.2 Per cent.
O (oxygen) .....	0.8 "
C O (carbonic oxide) .....	19.4 "
H (hydrogen) .....	16.6 "
C H (marsh gas) .....	2.8 "
N (nitrogen by difference) .....	52.8 "

The calorific power per cubic foot figures to 142.94.

The B. t. u. generated per hour were found on calculation to be 3,120,827.22 and the cubic feet of gas generated per hour, 21,831.6.

\* A 36-h. p. gas engine was shown in our issue of Feb. 11 1898.

#### Normal Safety vs. Normal Danger.

By A. J. Wilson.\*

Mr. Wilson began by calling attention to the fact that the idea of keeping automatic signals normally at danger is not new. Hall automatic signals were used on the Eastern Railroad and on the New York & Harlem in 1871, and two signals were used for each block, the first being called the home signal and the second, several hundred feet beyond it, the safety signal. This latter stood normally at caution and did not change to permit the passage of a train until after the first signal had changed to the "danger" position, thus giving the engineman a sure indication that the rear of his train was protected by the signal. This same plan was also used on the Boston & Albany and the Old Colony.

With an automatic signal worked on the normal danger plan the battery is in use only while the signal is clear, thus saving a considerable amount of material and labor. On a certain road in Massachusetts there are signals worked on both plans; and those normally clear have to have their batteries renewed every eight to ten weeks while the others run from 12 to 18 months. This longer service effects a considerable saving. A 4-lb. zinc costs 35 cents; 4 lbs. of vitriol, 24 cents; breakage of glass jars (one in 20), one cent per cell. Coppers need not be considered, as old material will pay for new; and zincs can be used twice, making the cost 17 1/2 cents per cell. This makes a cost for material of 42 1/2 cents per cell each renewal, and this, if the battery is renewed every 10 weeks, or 5.2 times yearly, makes the cost per cell per year for material \$2.20. If the signals are worked on the normal danger plan and the zincs are used only once, the whole being renewed every 12 months, the cost, it will be seen, is only 60 cents a year, leaving a saving of \$1.60; or on 1,000 cells, \$1,600 a year. Besides this there is, of course, a large saving in labor.

Objections to normal danger are: more expensive to construct, more chances of trouble, more difficult to maintain and possibility of combinations which

will show a clear signal while the block is occupied. It is to be admitted that the first cost is \$25 more per signal (using 15 cells of battery); but a saving of \$1.60 per cell per year will defray practically all of this additional cost in one year. It is true that the extra contact is an objection, but in spite of this a comparison of records has shown that there is a difference in efficiency in favor of the normal danger. Mr. Wilson has never heard of a maintainer, having had experience with both kinds, who objected to the normal danger system.

#### The Embellishment of Railroad Station Grounds.

By A. Reinisch.†

The last quarter of the Nineteenth Century has witnessed great activity and progress in landscape development. Many private grounds have been made gems of beauty. Cities have spent immense sums in creating public parks, and have succeeded in a manner to even invite the envy of European cities which had a start of centuries, and had far better advantages, natural as well as economic. Most of these parks deserve the highest praise as regards the conception and execution of the subject. It is lucky that the individual who is such a lover of nature that he even contracted the tree-pruning habit, has laid out but very few and small grounds. To him no tree is perfect until trimmed into some fantastic form.

Within the last few years, or probably since the World's Fair, a better taste is noticeable. The once common habit of representing words, animals, insects, portraits of men, etc., by the use of bedding plants has almost entirely disappeared, and in its stead we find very attractive geometrical designs with a careful study both of outline and harmonious grouping of color. This progress is evident also in the park proper. Here more attention is given to distance, effects and perspective. More shrubbery and hardy perennials are planted as a fringe for clumps and belts of trees, bringing down the masses of foliage from the sky line to the rich, velvety lawn. The perennials have a double value as, together with the shrubs, the group produces constant flowers and color effects from the beginning of growth in spring until the heavy frosts in early winter.

Next to the city parks, railroad station grounds attract our attention. A beautiful park, however small, is most refreshing to the mind and restful to the eye, after traveling for some time through an

\* Abstract of a paper on Automatic Block Signals, read at the meeting of the Railway Signaling Club, Boston, Nov. 14, 1899.

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uninteresting piece of country. Waiting at a station we can pass an hour of pleasure by a stroll through the grounds, noting the color and fragrance of flowers here, or the peculiar characteristics of a tree there. While the city derives her means from taxation, the railroad company derives it from actual earnings. This fact carries with it a great economic question. Does it pay to beautify our station grounds? This question can best be answered by the fact that all those roads which have ever commenced the work have not only kept it up, but have extended it, and keep at the head of the department qualified men, who systematically conduct the work. In Europe this question has never come up. The European mind could not imagine a piece of public land without embellishment of some kind.

If the improvement of station grounds is demanded or at least appreciated in the East where the natural landscape offers so much more variety by its timber, farms, fields, etc., closely grouped, and fresh with rural life, how much more would it be esteemed on the treeless plains traversed by the Western roads. No wonder, when selecting his route, the traveler takes into consideration the scenery to be observed during travel.

Now comes the question: How to most successfully lay out the station grounds. This is far more difficult than to lay out a large park. When one large tract is to be converted into a park the gardener goes on the ground, he notes the trees on it, the most prominent undulations, he also studies the surroundings, makes a survey and topographical plan on which he carefully locates all improvements and features that may be suggested by the nature of the ground or the utility demanded. He becomes familiar with every detail of the land, and the final improved park lives in his mind as a mental picture; which, however, he may never live to see with his physical eye, as the time required to let the different plants grow into that complete beautiful form, the picture in the master's mind presents—often extends beyond the natural life of the gardener.

With station grounds it is different. These are many—mostly small. Each requires a different treatment, new conditions and different surroundings everywhere. But this is not the greatest difficulty. It is—on the Western roads especially—climate and soil. In the higher altitudes the rain is scarce, and when it comes, or is substituted by watering, it dries up very rapidly, and cools off the soil and plants too much. Sub-irrigation is costly, and in the above soil, which is almost impervious to water, not as successful as desired. Often the soil is sandy and stony or saturated with alkali, and has to be removed, and good soil brought in to replace it. Another disadvantage lies in the fact that the different pieces are scattered and isolated by considerable distances and cannot be watched and controlled as if kept under constant, direct observation.

The first step necessary for improving the grounds of a railroad is to select a suitable and convenient piece of land, large enough for all demands and purposes, on which to locate the greenhouses with their service buildings, and the nursery, both for the exclusive use of the road. The best location for such an establishment is near an important station. The greenhouse should be located on the north side of the track, and should be an object of beauty and attractiveness, surrounded by clean walks, well-kept lawns and flower beds. The background should be a forest or wooded piece of land to protect the glass from the cold winter winds. This can be made an attractive park as well as being a shelter, and may be connected by a walk with the nearby station.

The greenhouses are not only necessary for supplying the smaller grounds, where shrubs and trees cannot be used, with bedding plants, but they are also indispensable in starting cuttings and seedlings of shrubs, hardy perennials, etc., for the nursery, where they are kept until large and strong enough for permanent planting. With this equipment the gardener can do his planting with greater deliberation, and is more certain of success, not to mention their economic value. After having selected the land and procured the equipments the next step will be to procure the services of a competent landscape gardener, whom William Saunders describes as follows: "Landscape gardening is a comprehensive art, combining the genius of the landscape painter with the art of the practical gardener; the exact knowledge of the engineer with the poetical imagination of the artist. The professor of this art should also possess a good knowledge of the general principles of botany, architecture, geology, hydraulics, hydrostatics, mechanics, laws of heat and ventilation, horticulture and vegetable physiology" (and, he might have added, agricultural chemistry). At any rate, it is necessary to put in charge a competent and well qualified landscape gardener to prepare plans, and outline the work to be done, produce all the stock necessary, and take care of the details.

By way of remark, I would say that we sometimes see large and elaborate designs made up by the planting of an almost endless number and variety of bedding plants as a great center attraction. It is a question in my mind if in the majority of cases the result is worth the material used to produce it, and if it would not be better to scatter such material

over smaller stations. On larger grounds more park-like effects should be produced; bedding plants can then be used in the shape of geometrical designs in the foreground.

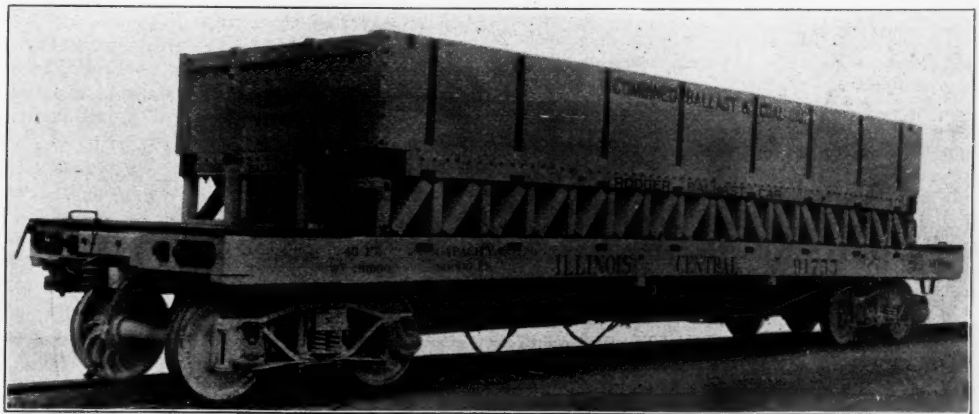
The latter treatment can be carried out at less expense, as the planting of hardy material is done once and is permanent, while the expense of the tender plant-effect has to be met every year. The reason for the above occurrence may be explained by the fact that companies, when building a depot, employ a competent architect, while the laying out of the grounds is too often entrusted to men without training or skill in landscape work, much less of a scientific education in this art. The results must correspond.

Lord Bacon said: "A man shall ever see, that when ages grow to civility and elegance, men come to build stately sooner than to garden finely, as if gardening were the greatest perfection."

We have the stately depots—now let us have the fine grounds.

#### New 80,000 Lbs. Capacity Combination Coal and Ballast Cars for the Illinois Central.

The Illinois Central has recently received from the Rogers Ballast Car Company, Chicago, 100 hopper bottom combination cars of 80,000 lbs. capacity suitable for coal, ore and ballast. The accompanying engraving shows one of these cars, arranged for carrying coal, which is 40 ft. long over end sills and 9 ft. 6 in. wide outside. The hopper is the full width of the car at the top and 30 ft. 6 in. long and at the bottom the length is 24 ft. 6 in. The sides of the hopper are sloped at an angle of about 45 degrees,



Combination Coal and Ballast Car of 80,000 Lbs. Capacity for the Illinois Central.

meeting at the center line near the bottom of the car and making the hopper 5 ft. deep. Two doors are placed either side of the center bulkhead and in one side of the hopper, and both doors together provide a discharge opening 20 in. wide and 24 ft. long. The cubic capacity of the hopper, level full, is 22 cu. yds., and as usually heaped with ballast from a steam shovel the capacity is from 28 to 30 cu. yds. The cubic contents of the coal box, not in place when the cars are used for ballasting, is a little more than 30 cu. yds., and as ordinarily loaded the cars hold from 40 to 42 tons of coal. The weight empty is 36,900 lbs.

The deep hopper in the center of the car requires a modification of the usual underframing. The side sills are 6 x 14 in., and the intermediate sills 8 x 10 in., both of long leaf Southern pine, and the end sills are 9 x 11 in. white oak. Instead of the center sills extending the full length of the car, these sills are short pieces of 5 x 10 in. oak framed into 9 x 10 in. oak headers placed just outside the hopper, and in turn the headers are framed into the intermediate sills; this construction is also tied together by four rods alongside the center sills which pass through the end sills and headers. The draft timbers are 5 x 8½ in. and the needle beams 5 x 9 in., all of white oak. Three truss rods are used on each side of the center which are 1½ in. in diameter with ends enlarged to 1¾ in. The needle beams pass directly through the hopper and a ¾ in. tie rod is recessed into the side of each beam; in a similar way the sills are tied together at two other points midway between the needle beams and the ends of the hopper.

The side and end plates of the hopper are 6 x 8 in. Southern pine, and the hopper plates and sills on either side form the upper and lower chords of a truss, the posts being 4 x 4 in. and the diagonal braces being 4 x 5 in. oak. The tops and bottoms of the posts and braces are set in malleable iron angle blocks, and the tie rods, recessed into the posts, are ¾ and ¾ in. in diameter. Three oak cross timbers, 5 x 9 in., are placed between the hopper plates with two ¾ in. tie rods recessed into the sides of each; one cross tie is at the middle of the car over the hopper bulkhead, while the others are at the middle of each compartment.

The hopper flooring is of 1½ x 6 in. Southern pine, ship-lapped ½ in. to prevent the joints opening from shrinkage. The planks are bolted to the top hopper

plates with ¾ in. carriage bolts, so that the load is largely carried by the trussed sides, the remainder being taken by the intermediate sills and headers.

The coal boxes are built to be interchangeable, and so that the sides and ends can be removed separately when the cars are to be used for ballasting. As shown in the engraving, the side planks are fastened with ½ in. bolts to inside stakes made of steel deck beams, the bases of the beams bearing against the hopper plates and sills to which the stakes are fastened by "U" bolts. The stakes are offset at the hopper plates, so as to bring the side planks flush with the outside of the car, and in this way the width of the box is about 13 in. greater than could be obtained if the usual outside stakes and pockets were used. By loosening the "U" bolts and removing the horizontal and vertical tie rods near the ends of the car, the sides of the coal box, and also the ends, can be lifted off; or replaced in a similar manner.

As stated, there are two door openings each 20 in. wide, and both are in the same side of the hopper, so that each of the two compartments, formed by the central bulkhead, has a door 12 ft. long. The doors are worked independently from opposite ends of the car. There are three malleable iron hinges for each door and three ¾ in. chains with ¾ in. rods and ¾ in. turnbuckles, while the chain shaft for each door is 1¾ in. in diameter and is worked by cast iron double-ratchet wheels and locks, and malleable iron levers.

The trucks of the Illinois Central cars are of the diamond frame type with metal body and truck bolsters. The upper arch bars are 1½ x 4½ in., the bottom arch bars 1¾ x 4½ in., and the tie bars ¾ x

4½ in. Malleable iron spring seats are used, 5 x 9 in. M. C. B. axles, and 33 in. cast wheels, weighing 650 lbs. each. The brake beams are metal and inside hung, and the cars have Westinghouse air brakes and M. C. B. couplers.

#### Foreign Railroad Notes.

An express train propelled by electric motors is now running on a standard gage track between Düsseldorf and Crefeld. The electrical equipment was furnished by the Siemens-Halske Company of Berlin. The line passes through Obercassel, Heerdt-Loerrie, Buderick, Osterath and Fischeln. The speed of the train reaches 60 km. (37 miles) an hour, the normal speed being 40 km. (25 miles). The car takes the current by means of an overhead trolley. Each car is run by a 40 h. p. motor acting directly upon the axle. This arrangement avoids the disagreeable noises of the gears. The cars contain 36 seats and standing room for 14 more passengers. The platforms are protected by glass, and the cars are lighted with 18 incandescent lamps of 16 c.p. each. They are heated in winter, and the furnishings are luxurious and elegant. The train is equipped with air brakes. The line is 22 km. (14 miles) long and serves for the transportation of both passengers and freight. The trains run every hour. A grade crossing makes necessary one intermediate stop, and the duration of the journey is about 30 minutes.

The vagabonds, mostly escaped convicts, who have long made a business of robbing the caravan trains in Siberia, now turn their attention to the railroad, and attack stations, engineers' camps or even town houses, not to say trains. The evil has become so formidable that the road watchmen have been supplied with arms and given authority to use them as military guards.

The Russians have built a turnpike road from a point on the southern shore of the Caspian Sea southward 220 miles to Teheran, the capital of Persia, a country almost destitute of roads heretofore. This highway was expected to greatly stimulate commerce between Russia and Persia, as steamboats connect it with the whole Volga country; but judging by the cost of travel the intercourse is not likely to be very active. For the journey over the 220 miles in any sort of vehicle, \$60 to \$85 is charged.





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#### EDITORIAL ANNOUNCEMENTS.

**Contributions.**—Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies in their management, particulars as to the business of the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and railroads, and suggestions as to improvements. Discussions of subjects pertaining to ALL DEPARTMENTS of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.

**Advertisements.**—We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay, EXCEPT IN THE ADVERTISING COLUMNS. We give in our editorial columns OUR OWN opinions, and those only, and in our news columns present only such matter as we consider interesting and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially either for money or in consideration of advertising patronage.

In our news columns during October we noted orders for 33,023 cars of all kinds. Of this number 19,418 were box, stock, furniture and refrigerator cars; 10,781 were gondola and coal cars; 1,700 were steel cars; 810 were flat cars and 314 were passenger and street railroad cars, 100 of the latter being ordered for export. Of the 33,023 cars, about 1,700 are to be built by railroads at their own shops. Orders for 323 locomotives of all kinds were also noted, of which about 38 were for export. The division of types of the 323 locomotives was approximately: 242 freight locomotives, 46 passenger and 35 switching locomotives. Nearly 100 more locomotives were ordered than in September, while about three times as many cars were ordered in October as were noted in September. The October orders amounted to 2½ times as many as were ordered in August, although the record for that month was a large one. The cars ordered during October almost equal in number those ordered in June, July, August and September combined. Some of the large orders placed in October have been deferred for many weeks on account of high prices.

A great deal of money is wasted in carrying freight and passengers, faster than need be, and this is especially true of freight. Naturally this kind of waste can only be stopped by agreement among railroad companies, and it is often so stopped in passenger business. But the great opportunity is in freight business. Concerning this, Mr. Kendrick in the last annual report of the Northern Pacific speaks as follows:

"The time of west-bound through freight has been lengthened between St. Paul and Portland fifty minutes. The time of east-bound through freight between Portland and St. Paul has been shortened one hour and thirty minutes. An investigation for the purpose of effecting a redistribution of the time of through freight trains is now being made. The schedule is still too fast for economical operation. The loss of hauling capacity of engines incident to increase in speed is enormous. The statement is ventured that there is no single reform that can be adopted in connection with railroad operation that will yield so large an increase in net earnings as the adjustment of time of freight trains with reference to the economical performance of motive power. The growing tendency to accelerate the movement of perishable freight is a useless extravagance, and emphasizes the necessity for competing lines to agree with respect to the time of through freight trains."

One way for a railroad to make the people of a town contented with a meagre train service is to make the service still more meagre for a while. We do not mention this plan for the purpose of commending it, as the railroad offering a challenge of that sort stands a good chance of being worsted, if public opinion is active and knows how to assert itself; but merely to mention a case. The New London Northern road (worked by the Central Ver-

mont) has run at least three passenger trains each way daily between New London and Palmer for over 30 years, but has lately reduced the number to two; and of course the patrons of the road are greatly exercised, especially north of Willimantic (south of there the service is better). In Monson, according to a local paper, the people find, after a few weeks' experience with two trains, that a service of three trains would be "perfection." Before, they wanted four, six or whatever each individual thought he needed. Indeed, a street road is being built to Palmer (four miles) to give unlimited frequency. (Possibly this prospective competition was one of the things that actuated the steam road in making its reduction.) At this writing we understand that the road will restore the third train. It will thus have failed to make any permanent reduction in its expenses; but it cannot be said that it has made no gain, for it has evidently made the people more appreciative of their mercies. This road has lately suffered a diminution of income by reason of the building of a competing line between New London and Norwich and this, no doubt, is one circumstance tending to necessitate scrimping on other parts of the line. By considering this, the people of Monson can see how for the past forty years they have enjoyed benefits which were partly paid for by people living in Connecticut, fifty miles away.

The reader will remember that Mr. S. J. Kidder, speaking before the Air-Brake Men's Association lately, explained the success of certain roads in braking partially equipped trains from the rear by the statement that they didn't; the braking was really done from the front. The orders are to begin pulling out the slack at the rear, and the officers attribute to this practice their success in avoiding damage from breaking-in-two; but the conductors privately tell Mr. Kidder, in substance, that the orders are not carried out. Our only purpose in again mentioning the subject is to do our duty, as impartial chroniclers, by reminding the reader that the other side make precisely the same claim. Mr. Nichols, of the Chicago, Rock Island & Pacific, the champion of braking from the rear, in his paper before the St. Louis Railway Club, stated (page 19) that in his confidential talks with freight conductors "down East" he was told that the orders requiring braking to be always begun at the front of the train were not carried out. The conductors wanted to take the best means of guarding against smash-ups when pulling out the slack, and, therefore, exercising their own best judgment, they began holding the train at the rear. But they kept quiet about it, and the Superintendent was none the wiser. In the presence of such a revelation of Spanish methods of administration as this, the reader will have to form his own conclusions. Perhaps he will not feel called upon to express any opinion at all on the situation, except that it is a good joke on both parties. At the same time there is room for the opinion that both theories, while never consistent with each other, have elements of strength individually. The Rock Island rule has a clause instructing freight train men, when approaching a stopping-place or when beginning to descend a grade, to "assume that the train has broken in two" until they get conclusive evidence to the contrary. As checking the speed first at the rear end enables the conductor to discover a broken drawbar, if there is one, and as checking the speed of the train first at the front end tends to conceal the fact of a break, perhaps it is fair to put it this way: that the Rock Island people prefer to discover the causes of troubles as soon as they exist, while the other party prefers to discover them at the foot of the hill, or after a stop has been made.

#### What Do We Mean by a Trainload?

Within the last few years a great point has been made of the average freight trainload as an index of the success with which a railroad is worked. In recent times it is rare to see a review of the annual report of a railroad in which mention is not made of this figure, and it is assumed that the trainload is a convenient unit of comparison.

It is obvious to one who will study the matter a little that if the trainload always meant the same thing it would still often be misleading to use it as an index of successful working without knowing the circumstances of working. It is dangerous to compare one railroad with another and indeed to compare one division of any railroad with another division of the same road, without knowing accurately, and allowing for, the local conditions. A railroad carrying coal and ore on low grades, with its business so distributed that it can get heavy

loads both ways, will, almost of necessity, have a heavier trainload than a railroad working in a populous manufacturing region and doing a large merchandise business. To compare the average freight trainload of the New York, New Haven & Hartford with that of the Cleveland & Pittsburgh Division of the Pennsylvania Lines is, on the face of it, misleading.

But a still further complication enters. A trainload on one railroad is by no means the same thing as a trainload on another. To make a comparison we must know how the trainload in each of these cases is computed. It does not take much study of annual reports to find that the trainload of one railroad is quite a different thing from the trainload of another. In general terms the trainload is the quotient obtained by dividing the ton-miles by the freight-train-miles, but what ton-miles should we use and what makes a train-mile? On one railroad only revenue freight is considered, and on another revenue freight plus company freight is used in making up the dividend in our sum. On one railroad the divisor is obtained by taking only the sum of miles actually run by freight trains. On another this quotient is obtained by including the mileage made by every engine with a caboose. On another are included the miles made by all helping engines and light mileage also. Which of these figures shall we take?

From the standpoint of the transportation department the ton-miles ought to cover all freight, whether revenue or company, while from the standpoint of one who wants to judge of the net revenue earning power of railroads it is fairer to include only revenue earning freight. Again, the motive power department wants to get credit for all the miles run by its engines, although, of course, the motive power department wants also to have it appear that its engines haul big average loads.

Recently a comparison has been made between the trainloads of the Chicago & Northwestern and the Chicago, Milwaukee & St. Paul with entire disregard of the fact that the St. Paul includes only revenue freight in its trainload, while the Chicago & Northwestern includes company freight as well as revenue freight. Thus the comparison is vitiated at the outset by a difference in at least one of the terms used, even if for other reasons the comparisons were not meaningless.

In looking over a dozen-and-a-half reports, with the special object of knowing whether the trainload is based on revenue freight only or includes company freight, we find that in half a dozen of these we are left entirely in doubt, so far as train and traffic statistics show. With such differences in practice and such obscurity in reporting it is not surprising that the careful student should feel suspicious of any broad comparison of trainloads. If we take, for instance, the New York Central and the Erie, we find that their trainloads are based on different accounting units. Each of these roads gives its locomotive mileage in detail, and we can easily ascertain how its trainload has been computed. Many large companies, as, for instance, the Great Northern, do not give locomotive mileage. The Erie's trainload is arrived at by dividing ton-miles by engine-miles or train-miles, which, in this case, is the same thing. But on the New York Central the engine mileage is approximately five million more than the freight train mileage, which latter figure, plus three-fourths of the mixed train miles, is used as the divisor in arriving at the trainloads. We must assume that helping engines are not used in this computation. On the other hand, the Erie obviously includes helpers and pushers and light engines, and in this computation a double-headed train would count as two trains. Obviously, no proper comparison can be made between the trainloads of these companies any more than between the Chicago, Milwaukee & St. Paul and the Chicago & Northwestern, although for different reasons.

A like diversity will be found in the treatment of mixed train mileage. The Erie and the New York Central will serve again to illustrate the varying practice. We find in the Erie report no mention of mixed train miles, and yet it must run more or less such trains. The New York Central report gives the mixed train mileage, and the trainload reported can only be found by taking three-fourths of the figure given and adding it to the freight train mileage. This is the division recommended by the Interstate Commerce Commission and accepted by many roads; a few distinctly state that mixed mileage is arbitrarily divided, as three-fourths freight and one-fourth passenger. In most cases, however, where it is given it is necessary to test the figures to find out how it is disposed of in ascertaining the



trainload. Many companies do not report it at all and we can only guess what cognizance is taken of it. Others divide it as 50 per cent. freight and passenger. The Great Northern apparently counts all its mixed train mileage as freight, although its Comptroller was Chairman of the Committee of the Accountants' Association which recommended a different allocation. This company's trainload can only be arrived at by adding all the mixed mileage to the freight train miles. There are other companies which seem to follow the same method.

It might be assumed that there is security in comparing the results on one road in one year with those in another year, possibly the only valuable use, by the way, of a comparison of trainloads. But even this can not be done without caution. Railroad change their methods of computation and do not always make that fact known in their annual reports. It is sometimes only discovered by finding in different reports two figures of the trainload for the same year.

We cannot, for instance, accurately compare the present trainloads of the Chicago & Northwestern with those before 1895, for a note in that year's report, and since omitted, indicates that a change was made in the methods of compiling freight train mileage. The 1898 trainload of the Illinois Central is reported this year at a considerably larger figure than in the 1898 report. The explanation given is that, in last year's report, over one million train-miles, representing "way switching," were included in the reports of freight train mileage, this item being now excluded. These changes made by both these companies (and others might be named) indicate a relatively greater gain in the trainload figures than has actually occurred. Yet a financial journal has recently compared the growth of the Northwestern's trainloads, overlooking the fact that they are different figures.

If the differences in reporting trainloads amounted merely to a distinction between engine and train-miles it might be possible, by carefully distinguishing between the two, to at least lessen the confusion. Even the necessity of examining into the questions of ton-mileage and mixed train mileage, which we have referred to, is easily enough comprehended, to be borne in mind and guarded against. The differences, however, are deeper than a distinction between the load per engine and the load per freight train run. There is nothing in any annual report to indicate how "way switching," which the Illinois Central has now begun to exclude from its freight train mileage statistics, is disposed of. Arbitrary allowances for mileage not actually made are often allowed, but it is impossible to tell anything about these matters from the published reports. A company which excludes double-headed, pushing and much light mileage from its report of train-miles may yet count a locomotive running with a caboose to bring back a loaded train, as a train, and its mileage is added to the freight train mileage.

At any rate it is quite clear that there is no such thing in railroad statistics as a uniform train-mile. If there were, enough differences in other accounting methods would exist to prevent the existence of a uniform trainload.

#### Annual Reports.

Great Northern.—The annual report of the Great Northern for the year to June 30 records a material expansion in traffic and in revenues, besides extensive changes in the finances of the company and important additions to the property. The capital stock has been increased from \$25,000,000 on June 30, 1898, to \$90,000,000, and the dividend paid has been raised from the 6 per cent. paid on the old capitalization to 7 per cent. a year, on the present volume of stock.

Of the new stock, \$15,000,000 was used to retire the same amount of collateral trust bonds, the only mortgage debt of the Great Northern proper; \$10,000,000 was used to purchase the stock of the Seattle & Montana; \$25,000,000 to acquire the stock of the St. Paul, Minneapolis & Manitoba, and of the remaining \$15,000,000, \$7,500,000 was used to take up new stock of the Eastern Minnesota, to purchase the Spokane Falls & Northern, and to acquire various other properties. These changes further consolidated the system and increased the mileage included in the statistics of the report from 4,446, the average reported in 1898, to an average of 4,786. The miles operated on June 30 last were 4,996, against 4,698 a year before. The earnings of these lines for the last two years are reported below:

	1899.	1898.
Gross earnings.....	\$25,017,904	\$22,877,524
Operating expenses.....	12,164,002	10,854,706
Expenses and taxes.....	13,091,361	11,555,647
Net earnings ..	\$11,926,543	\$11,021,897

The gain in revenue follows large expansion in previous years. In 1898 the increase in gross and net was \$3,141,000 and \$2,890,000, respectively, and if we go back to 1895 the additions to gross receipts were \$8,500,000 and in net over \$5,000,000, with an increase of 412 miles in the average operated. Expenses are stated to include \$833,000 charged directly to that account, for improvement work. Besides this, there was appropriated out of the surplus balance \$1,200,000 for permanent improvements, and \$600,000 for constructing the Cascade Tunnel, \$1,500,000 and \$750,000 having been appropriated for these purposes in 1898.

The revenue account of the company, which includes the results of the operation of the Manitoba lines, makes the following showing for 1899:

Gross receipts.....	\$19,057,814
Net earnings.....	8,902,225
Rentals.....	4,835,299
All charges.....	4,916,510
Net charges (less dividend on Manitoba stock).....	4,137,324
Balance.....	4,764,401
For improvements.....	1,800,000
Surplus.....	2,964,401

The balance shown above is carried into the income account, and with the surplus receipts from the other companies in the system, the Eastern Minnesota and other rail lines, the Northern Steamship Company, etc., and proprietary companies, forms the fund out of which dividends are payable. This income account makes the following comparative showing:

	1899.	1898.
Balance from Manitoba lease.....	\$2,964,401	\$1,090,303
Interest on securities owned.....	2,239,637	1,325,776
Miscellaneous income.....	434,188	1,152,690
Total income.....	\$5,638,226	\$3,571,769
Dividends.....	3,851,034	1,500,000
Balance.....	\$1,787,192	\$2,071,769

The net balances of the proprietary companies in 1899 were \$4,114,215, of which only \$2,000,000 was turned over to the Great Northern and appears above.

The traffic statistics of the company show that the tons one mile increased 11.36 per cent., the car miles 6.24 per cent. and the freight train miles only 4.84 per cent. The average train load increased from 316 tons to 336 tons, or 6.29 per cent.

With a drop of 1½ per cent. in the average ton mile rate from 9.32 mills to 9.16 mills, the train mile receipts increased nearly 5 per cent., from \$2.99 to \$3.13. The reduction in wheat rates average 1.3 cents per bushel, equivalent to about \$875,000 on the tonnage carried. No commodity table is given, but the wheat tonnage is said to have increased 1,913,000 tons, and other business 1,433,000 tons.

Mr. Hill details at considerable length the improvements carried on during the year. He refers to plans for grade reductions on the Pacific extension and on the Montana Central. "A large part of this work is now under way and will be completed during the current year, and it is expected that the entire work will be completed within 18 months. The Cascade Tunnel is well advanced and will be ready for trains in the fall of 1900, at which time all the improvements on the entire transcontinental line should be finished."

The more important improvement work of the year includes building 803 miles of fencing, 7,980 ft. of steel bridge, 21,500 ft. of trestles filled in and widening grades, ballasting, etc., on 284 miles. Work of this nature involved altogether moving 4,700,000 cubic yards of material.

#### Compound Locomotives on the Wabash.

The performance of the Class "G" freight locomotives of the Wabash Railroad, which were described in our issue of April 1, 1898, offers an exceptionally good opportunity for a comparison between similar compound and single expansion ten-wheel locomotives in fast freight service. Both kinds were built at the same time and differ only in the cylinder proportions, the compounds, built by the Richmond Locomotive Works, having cylinders 20½ and 32 x 26 in., and the simple engines 19 x 26 in. cylinders. The driving wheels of both are 63 in. in diameter, the working steam pressure 200 lbs., and the weight in working order is approximately 155,000 lbs., with 120,000 lbs. on the driving wheels.

During the first ten months that these new engines were in service two compounds and five simple engines were used on the Eastern Division hauling the same class of trains, and on the Middle Division there were three compounds and fifteen simple locomotives. The average results are as follows:

	Eastern Division.	Simple.	Compound.
Average cars per train.....	27.3	28.9	
Average pounds of coal per car-mile.....	6.9	5.3	
	Middle Division.		
Average cars per train.....	29.7	29.5	
Average pounds of coal per car-mile.....	5.6	4.5	

It will be seen that on the Eastern Division the trains hauled by the compounds averaged 1.6 cars more than those of the simple locomotives, while the compounds showed a fuel saving of 23.2 per cent. on a car-mile basis. On the Middle Division, the cars per train averaged very nearly the same for both, and the compounds showed a fuel saving of 19.6 per cent.

Mr. G. M. Burns, Fuel Agent of the road, states that in his opinion the comparison is as fair as can

be made, but calls attention to the fact that the compounds were at some disadvantage, being a new type of locomotive with which the men were unfamiliar.

The great rush of freight continues on all the principal railroads without change. Mr. Cowen, President of the Baltimore & Ohio, says that his road could use 10,000 more freight cars if it had them; and many other presidents could doubtless make statements of the same kind, varying only in the number of thousands. Mr. Cowen says coke in very large quantities has to be stored at the ovens waiting for cars, and that lake vessels are so hurried with iron ore shipments that they return to Lake Superior light, when they could get a load of coal if they would take the time to load it. This will throw a large amount of coal to the railroads after navigation closes. The newspapers print many general but indefinite statements about advances in freight rates. While this may be true about some commodities, it cannot be said that there is a "general" increase. Grain rates from the Western States to the Atlantic seaboard were advanced Nov. 1, as heretofore announced. Those to Gulf ports, for export grain, have also been advanced. The Trunk lines have abolished their special iron tariff, which makes an advance in that class of goods, though the extent of the advance cannot be stated, owing to the variety of classes into which the different kinds will now be placed. Rates on pig iron from Birmingham to the Gulf coast have been advanced. Other special tariffs here and there have been advanced, but it is by no means true to say, in the sweeping manner of the newspapers, that "the railroads are taking advantage of the boom to increase their charges to the public." In a great many cases it ought to be true, but the way to do it has not yet been found.

The American Railway Association, at its meeting in New York last month, took action looking toward inviting the International Railway Congress to hold a session in the City of Washington in October, 1904. This is a matter which was not given out in connection with the report of the meeting which we published in our issue of October 20. The Executive Committee offered a resolution to the effect that the delegates of the Association who are to go to Paris in 1900 should convey the invitation, but it was decided after some discussion, on account of the small attendance to take a letter ballot on the resolution, and no final vote was taken. The fact that certain of the large railroads belonging to the Association are members of the Congress in their own behalf made it seem undesirable to settle the question at this meeting, although there was no objection to the proposition, and every member who spoke on the resolution was heartily in favor of it. It is estimated that the expense incident to holding a session of the Congress in the United States would be about \$35,000, and the Executive Committee proposes that this sum be raised by four annual assessments on the members of the Association, which would make the burden very light. The Association made an appropriation of \$2,000 for the expense of headquarters at Paris in 1900.

There are important iron mines far to the north in Sweden whose present outlet is by a short rail route, whence the sailing route to England is somewhat circuitous. But the mines are not very distant from the Norwegian coast on the German Ocean; and Norway is about to build a railroad to give the ore an outlet in that direction. It will be over a difficult country, with many tunnels; and very little traffic except ore can be hoped for. The company owning the mines has made a contract by which it is to pay a certain interest on the cost of the road and the working expenses of the ore traffic. It will also construct the apparatus for discharging the cars directly into ships at the Norwegian port (Narvik, on the Ofoten Fiord) "on the American plan," by which it is hoped to load 1,000 tons in an hour. The railroad, on its part, will carry 1,200,000 tons of ore without further charge. But it is expected that 3,000,000 tons per year will be forwarded. Only 25 miles of the road will be in Norway.

The various authorities concerned have matured a plan to provide for direct exports from stations on the line of the Siberian Railroad to Western Europe, by way of Archangel, on the Arctic Ocean. In that place an office will be established, to which shippers may consign freight, in car-load lots, for export to London, Hamburg, Rotterdam, Antwerp and other principal foreign ports. The stations from which the goods are shipped will make advances, at a low rate of interest, on the freight, which for grain may amount to 80 per cent. of the value of the grain at that station. The Archangel office will undertake the part of a forwarding and commission merchant, and will sell for the consignor all raw Siberian materials, when forwarded in car-load lots. It will also execute orders for the purchase and importation of foreign machinery, etc., into Siberia.



## NEW PUBLICATIONS.

The Stereopticon Method of Instructing Railroad Employees. By W. J. Murphy, Superintendent of the Cincinnati, New Orleans & Texas Pacific Railway, Lexington, Ky.

Mr. Murphy has found among railroad officers and others so much interest in his use of the stereopticon as an aid in examining trainmen and other employees on their knowledge of the rules concerning fixed signals and other subjects, that he has published a description of his methods in book form, and the heading of this article gives the title of the book.

A good description of the methods employed was given in a paper which was read by Mr. Murphy before the Central Association of Railroad Officers at St. Louis last July and which was noticed in the Railroad Gazette at the time (page 536). In the Proceedings of the Association, as well as in the book now before us, pictures, suitably colored, are given to show the kind of views that are thrown on the stereopticon screen in catechising trainmen. Semaphores, high and low, lamps, and flags on the front and rear ends of trains, and any other features of practice which can be made clearer by illustration, are used. Mr. Murphy also gives specimens of the pictures which he shows in the stereopticon to elucidate questions about what should be done with a locomotive when it breaks down on the road. The screen and lantern are also used for showing colors in the examination of men for defects of vision.

Mr. Murphy has already had a number of orders for copies of his book, including one for 200 copies from a single road. It has also been received with favor by a number of technical schools, where the value of pictures in teaching is quickly appreciated.

The White Hall. By Cy Warman. 12mo., 198 pages, cloth. New York: Charles Scribner's Sons. 1899. \$1.25.

Mr. Warman has added another to the number of railroad stories which he has written, and this, while not one of the best things that he has done, is sufficiently good. It is a sentimental, romantic story, with plenty of incident and with enough pathos and humor and invention and other sound human qualities to appeal to any reader who has the sense to enjoy romance. It is not very novel. There are the wrecked bridge and the flagged train; the train robbers and the heroic bad boy who defeats them; and there are all the old properties to which we are accustomed. But there are also knowledge of the feelings and doings of the humble people of whom the author writes, and detailed knowledge of railroads and railroad men, which, taken together with the fundamental human qualities mentioned above, suffice to make an entertaining story.

Statistics of the Railways in the United States, 1898. Washington: Government Printing Office.

The Interstate Commerce Commission has just issued the complete report of the Statistician for the year ending June 30, 1898. Persons wishing copies can, no doubt, get them by writing to Secretary E. A. Moseley at Washington. The principal totals of mileage receipts, traffic, etc., shown in this report were given in the Railroad Gazette of July 21, 1899, page 522.

## TRADE CATALOGUES.

Ajax Products.—Under this title the Ajax Metal Co., of Philadelphia, issues a 32-page catalogue which contains information concerning the composition and special uses of the Ajax metal. This company turns out copper metals, white metals, finished specialties (as trolley axles, wheels and harps), and jewelers' specialties. Those familiar with articles on bearing metals in the Railroad Gazette will remember that the Ajax metal is an alloy of copper, tin and lead in the proportions of 77, 11½ and 11½ respectively. The large proportion of lead is used on account of the anti-frictional qualities of this metal, and if it can be given the proper support or strength, makes the best kind of a bearing metal for the service. This catalogue also contains valuable information concerning the microstructure of bearing metals. The engravings have been made with care.

Plate Graphite.—The Joseph Dixon Crucible Co., Jersey City, N. J., issues a pamphlet especially concerning the use of plate graphite for cylinders and valves. Material scattered through various other publications of the company has here been gathered for convenient reading.

## The Rail Situation.

The belief that the price of steel rails would advance still further and remain so for some time, caused the booking of orders for next year's delivery, as far back as August. The Eastern mills at that time quoted \$28, and Western mills \$29 a ton. The price advanced until last week, when it culminated in the large railroads placing orders on a suggestion from the rail makers that prices would be advanced, and that orders would be taken at about \$33. Rails delivered this year on orders booked in 1898 were at from \$16 to \$20 per ton. The orders resulting from the notification by the steel rail mak-

ers are estimated to aggregate more than half a million tons; and this, in addition to the orders held over, brings the total to from 1,200,000 to 1,500,000 tons. It is impossible to get anything but approximate figures either for the totals or for the various roads. The figures given above and those which follow are the best we can get. Among the large railroads which placed their orders before the advance are the Pennsylvania, with 105,000 tons; Illinois Central and Union Pacific, each 50,000 tons; the Baltimore & Ohio, 43,500; New York Central, 35,000; Lehigh Valley, 12,000 tons; the St. Paul and Chicago & Northwestern, each 40,000 tons; the Great Northern, 15,000 tons; the Grand Trunk Ry. is reported to have placed an order with a concern in the United States for 1,000 tons. Among the early sales were 145,000 tons for the Harriman syndicate. The Louisville & Nashville has also placed a large order. Since the advance was made to \$35, it is stated that one road has placed an order for 20,000 tons.

The annual capacity of the country for Bessemer steel is about 6,500,000 tons and the combined order for rails will consume about one-fourth of the output. Old iron is being bought wherever it can be had. Some railroads are taking up their old rails and selling them, getting more for the old iron than the cost of the new rails. The following are the prevailing prices for new rails: Standard sections, lots of 200 tons or more, \$35 per ton; in lots of 100 to 200 tons, \$37; carload lots, \$38; less than carloads, \$40; light rails, from 25 to 50 pounds per yard, \$37 per ton. All the prices quoted are f. o. b. Pittsburgh mills. Old iron f. o. b. New York brings \$25 a ton, and old steel scraps \$22.

The Baltimore & Ohio's order is for 85-lb. rail, the order being divided as follows: Carnegie Co., 26,000 tons; Maryland Steel Co. and the Cambria Steel Co., each 5,000 tons, and the Federal Steel Co., 7,500 tons. The contract price is about \$33 per ton, or 87 per cent. more than the Receivers paid for rails during the time they had charge of the property. Of the total amount which is ordered, the B. & O. proper will get 26,000 tons and the B. & O. S. W. 15,500; the Pittsburgh & Western, 4,000 tons, and the Cleveland Terminal & Valley, 1,000 tons. The Pennsylvania Railroad's order was placed with the mills along that road.

## TECHNICAL.

## Manufacturing and Business.

The S. A. Woods Machine Co., of Boston, Mass., with car department office at Chicago, Ill., has just completed a large addition to its works, by which it is calculated that the capacity will be increased one-third. The company's line consists of hollow chisel mortisers, both vertical and horizontal; heavy automatic car gaining machines; automatic cut-off saws, and jointers; car sill planers or dressers; moulders and similar tools.

Mr. E. W. Hodgkins, representing the Q and C Co., sailed Oct. 14, in the Umbria, for an extended trip through Europe, looking after the interests of his company. Mr. J. K. Lencke, who has been abroad since January 1, has been recalled and is no longer in the employ of the Q & C Company.

The Atchison, Topeka & Santa Fe is preparing to introduce the piece-work plan in all its shops, beginning with those at Topeka.

Reade & Bowler, American Trust Building, Cleveland, O., are offering for sale one hydraulic wheel press and one Bement car wheel boring machine.

Clarence J. Allen, P. O. Box 528, Milwaukee, Wis., wants a second-hand geared locomotive for a 36-in. gage wooden tramway.

The Bucyrus Co. of South Milwaukee, Wis., is building for the Wisconsin Central a steam shovel which, it is said, will be the largest and most powerful in the United States. This shovel, which will be built almost entirely of steel, will weigh about 100 tons, will carry a dipper of 5 cu. yds. capacity and is expected to handle 10,000 cu. yds. a day. Special cars, to hold about 40 cu. yds. each, are being built for it. The company is also building some very powerful shovels for the ore country, to carry dippers of 3 cu. yds. capacity. One is for W. J. Olcott, of the Consolidated Iron Mines.

Henry J. Davis, representative of the Dickson Locomotive Works in New York City, has been appointed Eastern Manager of the Cornell Machine Co., of Chicago, Ill., maker of gas and gasoline engines. Mr. Davis will not sever his connection with the Dickson works.

McCord journal boxes have been specified on 3,300 cars for the Lehigh Valley, noted last week, and McCord journal boxes and Johnson hopper doors on 200 cars ordered by Delaware & Hudson.

## Iron and Steel.

The Pennsylvania Engineering Co. has been organized with a capital of \$150,000 by Wm. E. Reis, E. C. Darley, Geo. P. Berger and R. C. Patterson. This company has taken over an old steel plant in New Castle, which it will rebuild.

The Occidental Smelting Co., organized several months ago, will build a smelter near Seattle, Wash. The site chosen was at one time owned by the Great Western Iron & Steel Co. and includes 120 acres.

Application has been made by John J. Albright of Buffalo for a grant of 50 acres of land under water at Stony Point, near Buffalo, to be used as part of a site for his proposed steel plant.

The American Steel & Wire Co. of Chicago, to have a finishing mill near its two blast furnaces in Woodsrun, Allegheny, will build a plant on Nevill Island, opposite. The contemplated work is estimated to cost \$1,000,000.

The Harrisburg Nail Works at West Fairview, Pa., has advanced the pay of all its employees 10 per cent.

The new company which has taken over the Pennsylvania Furnace Company's plant at Sheridan, Pa., has elected the following officers: President, Gen. E. Burd Grubb, Burlington, N. J.; Vice-President, James A. Coram, Boston, Mass.; Cashier, E. C. Hopkins, Boston; Treasurer, T. E. Hopkins, Boston. The old Auditor, Benjamin Whitely, is still with the company.

The plan to sell the Birdsboro iron plants of the E. & G. Brooke Iron Co., to Philadelphia capitalists is reported to have been declared off.

The Temple Iron Co., with office in Reading, Pa., will build a new breaker at Wyoming to replace the structure burnt last August. The new building will be about the same size as the old structure, viz., 90 ft. wide, 85 ft. deep and 160 ft. high. The aggregate cost is placed at \$100,000.

The Erie RR. Co. has just completed the customary yearly contracts for the renewal of bridges for the coming season. Among those of any great importance is a new double-track bridge to be built over the Tonawanda Creek and the Erie Canal at Tonawanda, N. Y.

Reports state that C. R. Baird & Co. of Philadelphia are negotiating to buy the Fritch iron beds near Reading, Pa. This tract covers 26½ acres and contains hematite ore.

Reports state that the Crown Smelting Co. will build an addition to the plant on Concord Ave., at the Philadelphia, Wilmington & Baltimore RR., and contracts have been let to A. R. Kerr & Co. for the new buildings.

The Natchez, Urania & Ruston, owned and operated by the Urania Lumber Co., Urania, La., wants at once 300 tons 35-lb. rails.

## Atlantic Ave. Improvements and the East River Tunnel.

The Atlantic Avenue Improvement Board, through Mr. Eugene G. Blackford, Chairman, has filed a request with the Alderman of New York City to allow the road to carry out the proposed improvements on Atlantic Avenue, Brooklyn; also, to grant permission to build the proposed tunnel from Flatbush Avenue under the East River to Church and Cortlandt Streets, New York. The plans for this work have been frequently referred to in our columns, and a profile of the route along the line of the proposed improvements was given in our issue of May 5 last. Mr. Blackford states that a company has been formed to build the tunnel, but cannot proceed until action is taken by the committees of the Board of Aldermen, and three months have passed without any action either on this or on the Atlantic Avenue improvements. In the meantime the Board is powerless to proceed with the work of removing steam from the surface of Atlantic Avenue.

## Committees of the Master Car Builders' Association.

The following are the various committees of the Master Car Builders' Association for 1900:

Standing Committees.—Arbitration—G. W. Rhodes, Chairman; J. McKenzie, M. M. Martin, G. L. Potter and J. N. Barr; Supervision of Standards and Recommended Practice of the Association—A. M. Waitt, Chairman; G. L. Potter and W. Apps; Triple Valve Tests—G. W. Rhodes, Chairman, A. W. Gibbs, J. O. Pattee and W. S. Morris; Brake Shoe Tests—S. P. Bush, Chairman, G. Gibbs and R. P. C. Sanderson; Prices in Master Car Builders' Rules—J. N. Barr, Chairman, S. P. Bush, J. H. McConnell, S. A. Charpiot and T. B. Purvis, Jr.; Tests of M. C. B. Couplers—W. W. Atterbury, Chairman, W. P. Appleyard, F. A. Delano, W. S. Morris and H. Monkhouse.

Committees for Reports.—Air Brake Appliances and Specifications for Air Brake Hose—A. L. Humphrey, Chairman, A. M. Parent and W. H. Marshall; Design for Wheel Circumference Measure—J. J. Hennessey, Chairman, W. J. Hemphill and E. S. Marshall; Design for Journal Box, Bearing, Wedge and Lid for Cars of 100,000 Pounds Capacity; also Design for Journal Bearing and Wedge Gages for 80,000 and 100,000-lb. Cars—E. D. Nelson, Chairman, J. J. Hennessey and W. Garstang; Revision of Rules for Loading Long Materials—P. Leeds, Chairman, P. H. Peck, F. H. Stark, C. Collier, S. P. Bush, B. Haskell, W. H. Lewis and J. R. Petrie; Revision of Recommended Practice for Springs, including Design for Springs for 100,000-lb. Cars—J. S. Lentz, Chairman, A. G. Steinbrenner and F. W. Brazier; Revision of Passenger Car Rules—H. J. Small, Chairman, J. T. Chamberlain, F. Rearden, H. F. Ball and W. Garstang; Standard Center Plates—R. H. Johnson, Chairman, H. L. Preston and G. T. Anderson; Draft Gear—C. M. Mendenhall, Chairman, J. Macbeth and T. B. Kirby; Spread and Design for Side Bearings—J. W. Luttrell, Chairman, H. M. Pfleger and B. Haskell; Uniform Section of Siding and Flooring—R. P. C. San-



derson, Chairman, W. P. Appleyard and J. S. Lentz; Metal Dead Blocks; Safety Chains—S. P. Bush, Chairman, J. H. Pennington and W. McIntosh; Subjects—G. L. Potter, Chairman, A. M. Walt and A. E. Mitchell.

#### New Locomotives at the Juniata Shops.

The Pennsylvania Railroad Co. is building at its Juniata Shops at Altoona, 43 Class G 4-A, and 27 G 4 engines. These engines are of the mogul type and are intended for heavy freight service. The two engines are very similar in design, so far as dimensions are concerned, except that the G 4-A engines have drivers 68 in. in diameter, and the G 4 engines have drivers 62 in. in diameter. The boiler is of the Belpaire type, with 356 flues, and carries 225 lbs. steam pressure per square inch. The total heating surface of each engine is 2,814 sq. ft. The ratio of heating surface to grate area is 91.3. The cylinders on both engines are 20 in. x 28 in. and they are bolted to the saddle instead of the cylinder and saddle being cast together, which is fast becoming the standard practice. The tractive power per pound of m. e. p., by the usual formula, for each engine, is as follows: Class G 4-A (180.6 m. e. p.), and for class G 4 (164.7 m. e. p.), and the total tractive power with 80 per cent. of boiler pressure in the cylinders is 29,646 and 32,508 lbs. respectively. The steam and exhaust ports in the cylinder are very liberal, and the valve travel is 6 in. The engines are fitted with one steam pipe instead of two. The frames are of the solid type and are made of cast steel. None of these engines have as yet been turned out for service.

#### Colorado Coal and Iron Co. Improvements.

The Colorado Fuel & Iron Co. has increased its capital by \$2,000,000 common stock. The purpose of the increase is to enlarge the plant at Pueblo, Col., by building additional blast furnaces and auxiliary plants, the opening and equipment of new coal and iron mines, the building of coke ovens and the acquisition of additional coal and iron lands; also for additional working capital to conduct the increased business. Contracts have been made for a portion of the foregoing.

#### The Burma Bridge Again.

We have this additional information from the Pennsylvania Steel Co. about the bridge which that company is building over the Gokteik gorge in Burma and which we mentioned last week, p. 739:

The viaduct under contract in Burma will be located in one of the northern Shan states, 450 miles north of Rangoon, some 80 or 100 miles east of Mandalay, India. It is 2,260 ft. long, and the height at center is 320 ft., the columns being built for future double tracking. The location, except for the recent operations of railroad construction, is practically a jungle. Special quarters are being provided for the workmen, including hospital arrangements. Two steamships are now on the way loaded with material, the first having passed Bombay. A third and final shipment will go forward the end of November. Owing to climatic conditions no work can be accomplished in the way of raising steel until the first of November; operations were timed accordingly. The men sent from this country arrived in Rangoon early in October, giving them from three to four weeks to become acclimated. The erection plant was sent with the first steamer and includes a steel traveller with an overhanging arm 160 ft. long, and complete air plant to be used for riveting, reaming, etc., and an ample supply of hoisting engines and other appliances.

#### New York Rapid Transit Bond Reduction.

The Appellate Division of the Supreme Court heard argument Oct. 30 on the application of the Rapid Transit Commission for a reduction of the bond to be required from the contractors from \$15,000,000 to \$5,000,000, Corporation Counsel for the city acquiescing. The court reserved its decision.

#### Automatic Signals on the Reading.

The work of putting up Hall automatic electric block signals on the Philadelphia & Reading, which was begun several months ago, is now in active progress at several points. Between Pottstown and Bridgeport the work is done. It is expected that the equipment of the entire line from Philadelphia to Pottsville will be finished by Dec. 1.

#### Nickel Steel.

The reader will undoubtedly remember the address by Mr. H. F. J. Porter, of the Bethlehem Steel Company, made at the Master Mechanics' convention at Old Point Comfort, concerning the use of nickel steel on railroads. In conclusion he said that the company would make, for a limited time, forgings of nickel steel to the drawings of the railroad companies, at a reduced price, provided that the companies would keep a careful record of the service of these forgings and when they break return them to the Bethlehem Company with a full report. The Bethlehem Steel Company has recently reprinted Mr. Porter's address in full and circulated it among the railroad companies and has renewed the offer, limiting it, however, to the month of October.

#### Electric Head Lights.

The Chicago, Rock Island & Pacific has recently ordered from the Pyle-National Electric Headlight Co., Chicago, 30 electric headlights for locomotives. When these are delivered there will be about 60 locomotives so equipped on that road.

#### South African Trade.

In this column, in the issue dated October 20, mention was made of the establishment of a branch of the Cling-Surface Manufacturing Co. at Johannesburg, in the South African Republic, which seemed not to be opportune, inasmuch as, a few weeks after this branch agency was established, the Republic had submitted to the arbitration of arms its differences with Great Britain, and all its commerce was for the present close. The Cling-Surface Company wish to have recorded here the succession of events, so that none may think they knowingly established so exclusive an agency as this isolated Republic now is. They write: "The fact of the case is that we were solicited by one of the largest supply houses in Africa for the agency. They sent us a good, big, fat order, which was filled and paid for three weeks before the war broke out. We now put ourselves in your hands and ask you to correct the wrong impression undoubtedly obtained from your note."

We have no hesitation in recording a prediction that the war will be a short one, and with the result of giving to us—Americans as well as Englishmen—a chance to make money in the development of South Africa. This policy of "the open door" or "equal opportunity" is the one so convincingly urged by Lord Beresford in his recent addresses to the boards of trade in this country as well as in China and England. His book, "The Break-Up of China," is well worth reading by every manufacturer here who looks for foreign trade.

#### Estimates for Lake Harbor Work.

The annual report of Brig-Gen. John M. Wilson, U. S. A., Chief of Engineers, was made public last week. He reports that work on the Chicago River and harbor is well advanced. For the harbor work there is an unexpended balance of \$108,000, and it is estimated that \$100,000 will complete the work, of which \$60,000 is asked for the year beginning June 30, 1900. For the work of dredging the Chicago River \$206,167 remains unexpended, and an appropriation of \$137,000 is asked for next year to finish the work.

For Calumet harbor it is estimated that \$859,830 will be needed to complete the work, of which \$300,000 is asked for next year. For the Calumet River \$640,000 will be needed to complete the work, of which \$100,000 is asked for next year. The following are the estimates for river and harbor work at the more important Lake ports for the fiscal year ending June 30, 1901:

Illinois River .....	\$100,000	Grand River .....	\$250,000
Illinois and Mississippi Canal .....	1,000,000	Muskegon .....	84,200
Milwaukee harbor .....	51,000	Ludington .....	97,300
South Milwaukee .....	133,000	Manistee .....	38,200
Milwaukee harbor .....		Charlevoix .....	31,050
of refuge .....	224,650	Petosky .....	62,700
Racine .....	79,650	Duluth .....	837,000
Kenosha .....	149,250	Ashland .....	50,000
Fox River, Wis. ....	100,000	Marquette .....	50,000
Sheboygan .....	85,000	Detroit River .....	300,000
Sturgeon Bay Canal .....	33,500	Toledo .....	200,000
St. Joseph, Mich. ....	340,000	Sandusky .....	105,000
Michigan City, Ind. ....	258,000	Cleveland .....	560,300
Kalamazoo River .....	135,000	Ashtabula .....	160,000
Holland, Mich. ....	111,800	Conneaut .....	169,000
Grand Haven .....	42,600	Buffalo .....	116,661
		Tonawanda .....	250,000

#### THE SCRAP HEAP.

##### Notes.

The Chicago, Burlington & Quincy is putting electric headlights on some of the locomotives used on the fast mail and the Denver limited trains.

The dining cars of the New York Central, heretofore managed by the Wagner Palace Car Company, are now run by the passenger department of the road.

The new steamship H. B. Plant, for the Plant Line, was launched at Jacksonville, Fla., Oct. 25. The new vessel is of steel 130 ft. long with a capacity for 400 passengers.

The regulations for employees' uniforms on the New York, New Haven & Hartford have been issued for the winter season. The clause requiring the wearing of white shirts and black neckties is no longer applied to baggagemen and brakemen. Conductors and station agents are to be held responsible for the appearance of their subordinates. The requirements concerning the quality of the cloth and the color of uniforms are detailed and specific. Each uniform must be accompanied by a certificate from the manufacturer and this certificate must be filed with the Superintendent.

It is reported from Louisville that the Louisville & Nashville Railroad will not renew its contract with the Adams Express Company, having decided to form an express company of its own. The change will go into effect on Jan. 1, 1900.

Ten conductors have been discharged by the Long Island Railroad for allowing persons to ride free.

#### The Latest Black List Suit.

The jury in Judge Dunne's court at Chicago has returned a verdict against Joseph O'Day in his suit against the Chicago & Northwestern and Wabash railroads. O'Day claimed he was blacklisted and asked for \$50,000. The suit was a test case, based on an alleged blacklist in 1894. The attorney who is bringing all the recent blacklist suits had considered the claims of O'Day among the strongest, and it is said that he is now surprised that the evidence at the trial showed that O'Day was an un-

desirable man, having served a term in the Indiana State prison and had been in jail upon a larceny charge. A number of prominent railroad officials testified that they knew nothing of the alleged blacklist, among whom were J. T. Harahan, of the Illinois Central; J. M. Whitman, of the Chicago & Northwestern; H. L. Magee, of the Wabash; M. J. Carpenter, of the Chicago & Eastern Illinois; and W. H. Canniff, of the New York, Chicago & St. Louis. As in the Ketcham case, the plaintiffs failed to show evidence that there was an agreement or understanding between the Chicago roads in the matter of employing men who took part in the railroad strike.

#### Sinking of the Ferryboat "Chicago."

The Pennsylvania Railroad ferryboat "Chicago," on its way from Jersey City to Cortlandt Street, New York, at 12.30 on the morning of Oct. 31, was struck by the steamship "City of Augusta" when within about 300 ft. of the New York landing, and very soon sank in about 35 ft. of water. There were about 100 persons on the boat and nearly all of them escaped alive. At this writing it is reported that one person, a mail wagon driver, was drowned and two other persons are missing, but it is possible that there are others unaccounted for. The first reports indicated that the whistle signal for crossing each other's paths was first given by the "Chicago," that it was properly answered by the "Augusta," but that the latter vessel then moved contrary to the signals. The reports published on the following day were, however, less definite, and the cause of the disaster will probably be determined only by the judicial investigation. The night was clear. All of the women passengers and nearly all of the others secured life preservers before the boat sank, and the signals of distress given by both boats brought a large number of tugs promptly to the rescue.

#### Life and Accident Insurance for Alton Employees.

The Chicago & Alton has notified its employees that it will aid them in securing life and accident insurance. The terms on which this is to be done are set forth in a circular which reads:

"The company has entered into a contract with the Aetna Life Insurance Company of Hartford, Conn., the largest company in the United States issuing both life and accident policies, whereby all employees may obtain insurance upon most favorable terms. To aid its employees to secure the best accident insurance at the lowest rates, the company will bear one-half of the premium of the insurance company for all conductors, baggagemen, brakemen, engineers, firemen, bridge carpenters, and yard foremen and switchmen; and for all other employees, on account of the lower rates of premium to them, it will bear thirty per cent. of the premium. In connection with this accident insurance the management has also provided for the issuance to those of its employees who may desire it, a term life policy, insuring for a term of not exceeding five years, the employee against death from natural causes; and in aid of the employee desiring the term life policy, the company will bear one-half of the premium for the first year, the employee paying the premium for all subsequent years during the term. This term life policy, however, will be issued only to such as hold an accident policy in the Aetna Life Insurance Company, as provided for by this company, and for the same amount. The management offers this opportunity (it is in no respect compulsory), believing the faithful service of its employees, in all departments, warrants it in rendering them substantial aid in the protection of their families and of themselves."

#### Liquid Air in Boston.

Some months ago there was organized in Boston a company which had for its object "the manufacture and sale of liquid air, and the construction of engines, motors and automobiles and all kinds of machinery for the use of liquid air." This company is capitalized at \$5,000,000, apportioned for the benefit of the public into shares of a par value of ten dollars. The public, however, being unappreciative of the large-minded spirit of the corporation, the price of the shares has recently been reduced to four dollars, with, of course, a "prospective advance to five dollars in the near future." The company has been in existence about a year, but not one of its claims has been realized. It has not built a practical machine nor has it sold an ounce of liquid air made by machines from the patents it claims to hold. The stockholders have not received a cent in dividends from their investments. A visit to the office of the company found two middle-aged gentlemen, three stenographers and an office boy, to whom the applicant is referred for information. This representative of the company hands the inquirer a copy of the prospectus and a blank form for stock subscription. This is the extent of investigation allowed. At the factory in Cambridge precautions are also taken for preventing the valuable secrets from leaking out. Access to the engine room was finally obtained and the privilege was granted of looking at two antiquated boilers and a small steam engine. How the company is going to supply liquid air "for general consumption and to manufacture engines, motors and automobiles" on a total power equipment of about 80 horse-power is not altogether evident. An examination of the prospectus of the company reveals that the promoters propose to compress air to a temperature of about 312 degrees below zero, and hold it at a pressure of about 12,000 lbs. or more per square inch; and that they intend to work machinery at a pressure greater even than this. How they are going to handle the air is not stated. A ludicrous description of the apparatus for using power from liquid air for automobiles is found on pages 10 and 11, which if carried out is nothing more or less than another attempt at perpetual motion. Such simple problems as to how regulation is to be secured for the dynamo and for the air motor are problems of too small import to be thought worthy of consideration. To sum up in a word, the whole system is about what a boy of sixteen with some elementary knowledge of machinery might contrive. There is not a single detail worked out. With regard to the so-called inventors whose names the company is using, it may be said that not one has a standing in engineering circles, and none of the names are known to the general public.

#### Chicago Track Elevation.

The Chicago City Council, Oct. 23, passed an ordinance providing for the elevating of the tracks of the Pittsburg, Ft. Wayne & Chicago between Twenty-first and Fifty-fifth Sts.; the Chicago & Western Indiana between Twenty-first and Seventy-second Sts.; the Grand Trunk between Wallace and Morgan Sts., and the Union Stock Yard & Transit Co.'s tracks between Wallace and 45th Sts. The tracks of the Pittsburg, Ft. Wayne & Chicago are already elevated south of Fifty-fifth St., and the new ordi-



nance covers the portion intervening between that point and the finished work near the Sixteenth St. crossing; the proposed work on the Chicago & Western Indiana also joins the same work at the north end. In all, the elevation will do away with about 65 grade crossings, 58 subways will be built and the tracks on about 13 miles of right-of-way will be raised; the estimated cost is about \$2,500,000. The ordinance was based principally upon plans prepared by the railroads, but it is not certain that they will accept it in its present form, although the main features are known to be suitable.

#### Chicago Drainage Canal.

The Illinois State Commission to inspect the Drainage Canal will not make its preliminary report to the Trustees of the Sanitary District until the latter part of November. The Engineering Committee of the Chicago Sanitary District has changed the plans for the tailrace at Joliet which provide for the widening and shortening of the tailrace which will permit more men to work upon it and secure its earlier completion. Attorney General Akin of Illinois, acting for the Illinois and Michigan Canal Commissioners, on Oct. 27 asked the Court at Joliet for a temporary injunction preventing the Sanitary District from opening the Drainage Canal until provision is made for maintaining the Summit level. The Trustees of the Sanitary District will ask to have the suit removed from the State Court to the U. S. District Court at Chicago on the ground that, as legislative and constitutional questions are involved, the matter is one for the Federal Courts. The water in the Illinois and Michigan Canal is now kept level by a pumping station maintained at Bridgeport by the City of Chicago, and the Commissioners hold that the State law provides that the canal shall be maintained. When the Drainage Canal is opened the pumps at Bridgeport will no longer be needed to set the current of the Chicago River away from the lake, and this pumping station will be abandoned. The question for the Court to decide is whether the legislature had the power to grant rights to the Sanitary District in carrying out which the District will destroy the navigability of the Illinois and Michigan Canal. This suit and the other delays to the work previously noted make it certain that the Drainage Canal will not be opened on Dec. 1, Jan. 1 being now the date mentioned as probable for the opening.

#### New York City Bonds.

Bids for New York City bonds amounting to \$2,877,107.32 were opened by the Sinking Fund Commission Oct. 26. This is part of an issue of \$9,000,000 offered for sale on October 18 and withdrawn by the Controller. The proceeds of the bonds are to be devoted to the replenishing of the fund for street and park openings, for the improvement of Park Ave., above 106th St. and to pay the awards to the Long Island Water Supply Co. for its plant and franchise. Seventeen bids in all were received, ranging from 105.03 for the whole issue to 108.603 for part.

The Board of Aldermen of New York City, Oct. 31, passed a resolution authorizing an issue of \$4,000,000 in city bonds to continue work on the new East River Bridge. This brings the total of money appropriated for this purpose up to \$8,000,000.

#### An Electric Railroad from Joliet to Chicago.

Dispatches from Joliet, Ill., last week announced that the Joliet (electric) RR. which has a capital stock of \$600,000, a 50-year franchise and 22 miles of track through the business and residence parts of that town, has acquired all rights to the franchise for a street railroad from Lemont, about 33 miles, to Chicago. This puts the Joliet road in position to proceed with the extension of the Lockport branch of the system through to Chicago as soon as practicable. At a meeting of the stockholders of the Joliet road, Oct. 23, Directors were elected for the ensuing year and it was announced that on Nov. 1 the road would be transferred to the American Railway Co., which owns street railroads in several cities. The distance between Chicago and Joliet by the Chicago & Alton is 37.2 miles.

#### Chicago Bridges.

A conference was held Oct. 26 at the suggestion of the Illinois Manufacturers' Association, which was attended by Mayor Harrison, Commissioner of Public Works McGann, representatives of several of the elevator and manufacturing companies of the Goose Island district and of the Chicago Real Estate Board, for the purpose of considering suggestions about the bridges at Division St., Clybourn Place and North Ave., which have been closed to traffic. The city officials said that in view of the failure to get a large increase in the income of the city as expected, nothing could be done by the city to the bridges. A suggestion was made that a new bridge at Division St. be built by private parties, the city to pay 6 per cent. interest on the amount invested until such time as it could be returned.

Last week the City Council Committee on Harbors, Bridges and Viaducts, accompanied by City Engineer Ericson and Bridge Engineer Wilmann, went up the North Branch of the river on a tug to Belmont Ave. to inspect nine bridges which were found in bad condition, four having already been closed. The City Engineer estimates that \$1,625,000 will be necessary to replace these bridges with modern structures. The nine bridges examined were at Kinzie, Erie, Division (two), Weed and Indiana Sts., Clybourn Place and Chicago and North Aves. (Oct. 13, p. 716.)

A second trip was made several days later over the South Branch of the river to inspect the bridges at Randolph, Van Buren, Polk, Eighteenth and Twenty-second Sts., Archer Ave., Main St., South Western Ave., Fuller St. and Western Ave. The City Engineer has recommended new structures to replace the following: Randolph St., costing \$175,000; Polk St., \$100,000; Twenty-second St., double roadway, \$210,000; Main St., \$175,000; South Western Ave., \$100,000; Archer Ave., \$175,000; Fuller St., \$100,000. Repairs are recommended to the bridges at Van Buren St., Eighteenth St. and Halsted St.

#### LOCOMOTIVE BUILDING.

The Great Northern is receiving bids on 35 10-wheel and five switching locomotives.

It is reported that the Chicago & Eastern Illinois will order seven more locomotives. We have no official information.

The Minneapolis, St. Paul & Sault Ste. Marie is figuring on buying 10 very heavy decapod locomotives, but it is uncertain that they will be ordered.

The Northern Pacific has ordered 10 compound

consolidation and five 10-wheel freight locomotives for delivery next spring, from the Schenectady Locomotive Works.

We are officially informed that the Illinois Central is not in the market at present for locomotives, but that some options may be taken later for locomotives for delivery next year.

The Baltimore & Ohio has ordered 12 more Vauclain compound consolidation freight engines from the Baldwin Locomotive Works. These are in addition to the 50 referred to in our issue Sept. 29.

The Richmond Locomotive & Machine Works have received an order to build three 10-wheel engines for the Ystad-Eslofs Railroad of Sweden. They are for March 15, 1900, delivery and 16½ in. x 24 in. cylinders, 61½ in. driving wheels, Belpaire boilers with 176 charcoal iron tubes 2 in. in diam. and 12 ft. 6 in. long, and a working steam pressure of 185 lbs.; fireboxes, copper, 74 in. long and 34½ in. wide; and a tank capacity for 3,600 gals. of water. The engines will be standard gage and will weigh 103,000 lbs., with 74,000 lbs. on the driving wheels.

The six compound locomotives ordered by the Iowa Central from the Baldwin Locomotive Works, as noted in our issue of Oct. 20, will be 10-wheel locomotives with cylinders 14 and 24 in. x 26 in. and with a total weight of 148,000 lbs., of which 108,000 lbs. will be on the drivers. The boilers will be of the straight top type with a working steam pressure of 200 lbs. There will be 264 tubes, 2 in. in diam. and 15 ft. long, and the fireboxes will be 103 in. long and 42 in. wide. The tank capacity for water will be 4,500 gals. Westinghouse air brakes are specified.

Last week in our columns we illustrated and described a three-wheel coupled tank engine recently shipped to the Barry Railroad of South Wales by the Cooke Locomotive & Machine Co. The same works have recently built and shipped two engines of a similar class, with four pairs of driving wheels connected, for the Port Talbot Railway & Docks Co. of South Wales. They weigh in working order 169,000 lbs., with 137,000 lbs. on the driving wheels. The cylinders measure 19 in. x 24 in. and the driving wheels are 52 in. in diam. The engines will also have extended wagon top, crown bar, type of boilers with 219 tubes 2 in. in diam. and 11 ft. 11 in. long, and a working steam pressure of 175 lbs. The tank capacity will be 2,000 gals. of water and the coal capacity two tons. The special equipment includes Richardson-Allen slide valves, Carbon shell steel, Latrobe tires, Ramsbottom safety valves, Vacuum Oil Co.'s cylinder lubricators, Ashcroft steam gages, Vacuum Brake Co.'s brake equipment, Pickering springs, United Kingdom metallic packing, copper fireboxes, brass tubes, and Davies & Metcalf's exhaust steam injectors.

The New York Central & Hudson River has ordered the 90 locomotives referred to in our issue of Oct. 27, 25 switching and 25 moguls being awarded to the Schenectady Locomotive Works and 15 passenger and 25 moguls to the Baldwin Locomotive Works. The switching engines are to be delivered in March, 1900, and the others are for delivery in March and later. The switching engines will weigh about 128,000 lbs. and have 19 in. x 26 in. cylinders, 51 in. driving wheels, straight boilers, a working steam pressure of 180 lbs. and a tender capacity for 3,500 gals. of water and 10 tons of coal. The moguls will weigh about 152,000 lbs., with 136,000 lbs. on the driving wheels and have 20 in. x 28 in. cylinders, 57 in. driving wheels, wagon top type boilers, a working steam pressure of 190 lbs. and a tender capacity for 5,000 gals. of water and 10 tons of coal; five of the engines will have Vanderbilt corrugated fireboxes. The passenger engines will weigh about 162,000 lbs., with 125,000 lbs. on the driving wheels and have 20 in. x 28 in. cylinders, 75 in. driving wheels, wagon top type boilers and a tender capacity for 5,000 gals. of water and 10 tons of coal. All the tenders will have Fox trucks, charcoal iron tubes, Carbon steel fireboxes, National hollow brakebeams, Lappin brake shoes, Gould couplers, Leach sanding devices and French springs. The switching engines and moguls will have steel axles and Nathan lubricators. Consolidated safety valves are specified for the switching and passenger engines; on the moguls part will be Consolidated and part safety valves made by the Star Brass Co., of Boston. Midvale driving wheel tires will be used on the switching engines and on part of the moguls, while Standard tires are specified for the balance of the moguls. Monitor injectors will be applied to all of the moguls and passenger engines and Detroit sight feed lubricators are specified for the passenger engines. Utica steam gages will be used on the switching engines and on part of the moguls, while no special makes have been specified for the balance of the moguls and the passenger engines. The question of air brakes and of headlights is still open.

#### CAR BUILDING.

The Hocking Valley has placed an order for 1,000 box cars with Pullman's Palace Car Co.

We are informed that the Quebec & Lake St. John will soon order two parlor cars and 20 coaches.

The Chicago & Alton has just ordered 500 steel gondola cars of 100,000 lbs. capacity from the Pressed Steel Car Co.

It is reported that the Illinois Central is considering buying more freight cars, but we have no official information.

The passenger cars to be ordered by the Wheeling & Lake Erie, noted Oct. 6, will consist of three parlor cars and nine coaches.

The Northern Pacific has ordered 20 coaches from the Barney & Smith Co., and we understand will order more passenger cars soon.

We are informed, but not officially, that the Mobile & Ohio is receiving bids on 1,000 box cars of 60,000 lbs. capacity. Reference to this matter was made Oct. 20.

The Chicago, Burlington & Quincy needs additional equipment and we understand is contemplating ordering, within a short time, a large number of box cars, probably 2,500.

The Cleveland, Lorain & Wheeling has ordered 500 coal cars, 100 box cars of 60,000 lbs. capacity and 50 side dump coal cars of 80,000 lbs. capacity from Pullman's Palace Car Co.

It is reported that the Chicago & Eastern Illinois

has asked bids on 500 box cars of 60,000 lbs. capacity to be used in connection with the Cotton Belt and to be built from specifications of the latter company.

We understand that the Atchison, Topeka & Santa Fe has completed at its Topeka shops a steel dump car of 80,000 lbs. capacity, built of rolled sections, and materials have been ordered for 10 more of these cars. Materials have also been ordered for two steel box cars of 80,000 lbs. capacity, to be built of rolled sections.

Last week we noted an order given by the Norfolk & Western to the American Car & Foundry Co. for 500 stock and 200 coal cars of 60,000 lbs. capacity. The former will measure 34 ft. long, 8 ft. 6 in. wide and 8 ft. high inside; and the latter 33 ft. long and 8 ft. 3 in. wide. The specifications for both classes of cars call for wrought iron axles, Westinghouse air brakes, Hein couplers, Burgess coil springs and N. & W. standard bolsters, brake beams, brake shoes, brasses, draft rigging, dust guards, trucks and wheels. The stock cars will have double board roofs.

The 38 cars for passenger service ordered by the Illinois Central from the Barney & Smith Co. and Pullman's Palace Car Co. last month and noted in our issues of Oct. 13 and 27, are all for delivery in January, 1900. The two dining cars and nine chair cars will be built by the Barney & Smith Co. The dining cars will be 70 ft. long, 10 ft. wide and 6 ft. 10 in. high from sill to plate. They will seat 30 persons and mahogany chairs will be used. They will have Illinois Central standard six-wheel trucks. The nine chair cars will be 61 ft. long, 10 ft. wide and 6 ft. 10 in. high. They will have standard four-wheel trucks of the road, seats for 53 persons and separate smoking rooms. The six baggage cars, six composite cars and 15 coaches will be built by Pullman's Palace Car Co. The baggage cars will be 61 ft. long, 6 ft. 4 in. high and 10 ft. wide, and will weigh 86,000 lbs. They will have Illinois Central six-wheel trucks, double doors and blind ends, with narrow vestibules. The six composite cars will be 70 ft. long, 10 ft. wide and 6 ft. 10 in. high and will have six-wheel trucks and a baggage compartment about 33 ft. long. In the center will be a buffet with a section for card playing. The car will also have writing desk, library and 15 chairs for smoking compartment, and a total seating capacity for 53 persons. The 15 coaches will be 61 ft. long, 10 ft. wide and 6 ft. 10 in. high. They will have four-wheel trucks and seats for 63 persons. All of the cars will have steel axles, Monarch brake beams, plain cast iron brake shoes, Westinghouse high speed brakes, Janney couplers, Forsyth curtain fixtures, Fantasio curtains, Standard Coupler Co.'s steel platforms and draft rigging, bass wood dust guards, M. C. B. journal boxes with Morris Fletcher lids, Pintsch light, A. French Spring Co.'s springs, Paige 38-in. wheels, and all except the baggage cars will have Pullman wide vestibules. The steam heating system to be used has not been decided upon.

The Buffalo Street railroad is in the market for 100 open cars.

In reference to the cars for the Boston Elevated, referred to in our issue of Oct. 20, we are officially informed that no orders have yet been placed except for an experimental car. We understand that when this sample car has been received and passed upon, the road will at once order 60, similar in design, and that further orders will be placed shortly after.

#### BRIDGE BUILDING.

BALDWINVILLE, N. Y.—Contract for the iron bridge over the Seneca River for the towns of Lynders and Van Buren has been let to the Berlin Iron Bridge Co. of East Berlin, Conn., at \$50,000. Kelly Bros. of Syracuse are building the foundations. The bridge will be 225 ft. long. (Aug. 11, p. 572.)

BRIDGEPORT, CONN.—We are told that there is no intention at the present time of building a new drawbridge or station for the New York, New Haven & Hartford at Bridgeport. The company expects to elevated the tracks through the western part of the city between what is known as West Fairfield Avenue crossing and Main St., a distance of 10,000 ft. This work will remove nine grade crossings.

BUFFALO, N. Y.—The \$75,455 had from a recent sale of grade crossing bonds is not for new bridge work, as reported, but will be used to pay awards for damages by building the Seneca and Smith St. viaduct. (Oct. 27, p. 750.)

CALDWELL, IDA.—Bids will be received until Dec. 1 for a bridge across Indian Creek, according to the plans on file in the County Clerk's office. Edgar Meek, Clerk.

CAMDEN, N. J.—A petition has been made for another bridge across Cooper's Creek, midway between the Federal St. and Kalgham Ave. bridges.

CHATTANOOGA, TENN.—Reports state that the City Council will soon take up the matter of bridges on Market St.

CHICAGO, ILL.—The City Engineer, according to report, has been instructed to prepare the plans for the Canal St. viaduct, which is to cross the C. & N. W. and the C., B. & Q. (July 14, p. 512.) See also Scrap item on Chicago Bridges.

CINCINNATI, O.—Sealed proposals will be received by the Board of County Commissioners of Hamilton County until 12 o'clock noon, Nov. 11, for the substructure of a bridge over Ross Run on the Paddock Road, Millcreek Township. Eugene L. Lewis, County Auditor.

CLEVELAND, O.—Reports state that Mr. John D. Rockefeller has given \$250,000 to the Park Board of Cleveland, part of which will be used to eliminate a grade crossing of the Lake Shore & Michigan Southern on the Boulevard to Gordon Park.

DETROIT, MICH.—The bids received for the bridge over the Rouge River, at Fork St., between Spring Wells and Ecorse Townships, ranged from \$14,000 to \$24,975. (Oct. 27, p. 750.)

DUBUQUE, IA.—Reporters state that about one-third of the necessary money to build the proposed bridge at Eagle Point has been subscribed. This structure will probably be 3,500 ft. long. The Dubuque & Wisconsin Bridge Co. has been organized to build it.



**GRAND ISLAND, NEB.**—At the November election it will be decided whether a bridge shall be built over the Platte River between Hall and Hamilton counties. We are told that it will practically consist of four bridges, all of wood, and cost about \$5,000. (Jan. 20, p. 50.)

**GREENSBURG, PA.**—Iron bridges are to be built in Bell Township as follows: One near Avonmore and the other over Sulphur Run near Grange Hall, Waukena, to replace wooden structures.

**HOLYOKE, MASS.**—Chairman Walsh of the Board of Public Works is considering repairs to the two Cabot St. canal bridges and the two bridges on Lyman St.

**HOQUIAM, WASH.**—Plans have been prepared for a drawbridge over the Hoquiam River at Eighth St. by the company recently granted an electric railroad franchise. The length will be about 500 ft. D. C. Dillman, Tacoma, Wash., is interested.

**HUNTINGTON, W. VA.**—Reports state that surveys are being made for a bridge over the Ohio River either at Huntington or near Wellston, for a connection between the Columbus, Hocking Valley & Toledo and the Chesapeake & Ohio railroads.

**INDIANAPOLIS, IND.**—Nov. 6 is the date set for receiving new proposals for the abutments and steel superstructure for the proposed bridges over Fall Creek at Illinois St., and Meridian St. D. A. Downing, Chairman Board of Public Works.

The County Commissioners on Oct. 27 let contracts for the bridges over Fall Creek, near Hammondsport, and for the structures over Indian Creek and over Brady's Branch.

**KANE, PA.**—The Osborn Co., Cleveland, O., is preparing plans and specifications for the new bridge across the Philadelphia & Erie Railroad tracks at Kane. Length of span, 200 ft. Plans will be completed in about two weeks.

**KANSAS CITY, KAN.**—The viaduct at Sixth St. and Minneapolis Ave. will be repaired.

The City Council is endeavoring to have the Missouri Pacific rebuild the James St. viaduct, which was recently wrecked by a train.

**KANSAS CITY, MO.**—The city is now engaged in a suit to compel the Belt Line Ry. to build the proposed bridge on Kansas Avenue.

The Metropolitan St. Ry. Co. has let a contract for the viaduct on Brooklyn Ave. This company will also make repairs to the 18th St. viaduct.

Reports state that the Penn St. bridge at Twenty-fourth St., and the Terrace St. bridge at Twenty-sixth St., will be repaired.

**LA PRAIRIE, MAN.**—John E. Gayton, Clerk municipality of Pembina, Manitou, P. O., desires tenders for two steel bridges to span the Pembina River, one to be 75 ft. and the other 135 ft. in length.

**LEWISTON, IDA.**—County Commissioner Johnson is considering a site for building a bridge over Rapwal Creek, Cul de Sac; also for another bridge at the mouth of Tom Beall Creek.

**MARION, ALA.**—Perry County has issued \$5,500 bonds to build a bridge across the river at Fike's Ferry, near Marion. (June 30, p. 480.)

**MASSILLON, O.**—The bridge which the Wheeling & Lake Erie RR. will rebuild over the Tuscarawas River south of Tremont St., Massillon, will be a wooden trestle 464 ft. long. No contracts will be let.

**MERIDIAN, MISS.**—The Commissioners of Landerdale County are receiving bids for a bridge near Meridian. Proposals to be opened Nov. 8. B. V. White, Clerk.

At the same time and place bids will be received for a bridge across Ponta Creek.

**MILWAUKEE, WIS.**—It has been decided not to build a new viaduct over the Menomonee Valley, but it is probable that an appropriation of \$18,000 will be made to repair the old viaduct.

**MINNEAPOLIS, MINN.**—We are told that the \$70,000 received from bond sales was intended for rebuilding the bridge on Lyndale Ave. over Minnehaha Creek and the conversion of the foot bridge on 14th Ave. South East between University Ave. and 4th St. to a wagon bridge, and the construction of the piers for the bridge across the Mississippi River at 32d Ave. North. None of the money, however, was appropriated for this work. (Oct. 30, p. 734.)

**MONTESANO, WASH.**—Bids will be received by J. A. Sells, County Auditor, until 9 a. m., Nov. 10, for building a combination bridge (steel and wood) across the Chehalis River at Blackhouse Ferry. The span will be about 230 ft.

**MORRISTOWN, N. J.**—We have official information that plans are being prepared for the elimination of the grade crossings in Morristown by the D. L. & W. Full details are not decided.

**NEWINGTON, CONN.**—The New York, New Haven & Hartford has made a contract with C. W. Blakeslee & Sons, New Haven, for the elimination of the grade crossing known as Weathersfield, near Newington, on the Hartford Division. The crossing will be carried over the tracks on a bridge 24 ft. wide.

**NEW YORK, N. Y.**—A resolution was before the Council Oct. 25 permitting the Commissioner of Bridges to contract for the borings and soundings for the two new East River bridges, at an estimated cost of \$50,000.

**NORTHVILLE, MICH.**—The Railroad Commissioners have ordered an overhead crossing over the Flint & Pere Marquette RR. by the Detroit & Northwestern Ry. This bridge will be 22 ft. wide and the main span will be 42 ft. long.

The Detroit, Plymouth & Northville RR. was ordered by the State Railroad Commissioners to cross the Flint & Pere Marquette at this place by an under grade crossing.

**OMAHA, NEB.**—The new viaduct about 1,600 ft. long over the ravine and railroad tracks on Sixteenth St. is still under consideration. The old structure has been partly demolished and at present is not in use. The Union Pacific and the C., B. & Q. are to pay part of the cost of the new bridge. (June 2, p. 392.)

**OREGON CITY, ORE.**—The County Commissioners have ordered a bridge built on the petition of A. M. Scott and others, on Graves Road.

**OTTAWA, O.**—Putnam County, O., has disposed of \$10,000 of new bridge bonds.

**OVERPECK, O.**—Reports state that a bridge with a 500 ft. span is in contemplation.

**OZARK, ARK.**—Bids are wanted until Nov. 15, according to report, for a steel bridge about 270 ft. long to cross the Mulberry River, with 110 ft. of wooden approaches. B. W. Webb and J. T. Greer, County Commissioners.

**PATERSON, N. J.**—We are told that the proposed bridge over the Passaic River from the Little Falls Road to Westside Park will not be built this year. (Oct. 20, p. 734.)

**PHILADELPHIA, PA.**—The Board of Public Works opened bids on the 24th for building a bridge over Pennypack Creek, between Academy St. and Ashton road, as follows: Richard Walsh, \$12,809.75; H. S. Kerbaugh, \$14,350; Michael O'Rourke, \$12,000; John Baisley, \$15,000; John McMenamin, \$12,500.

Residents in the Twenty-ninth Ward are agitating for a bridge at Thirty-third St. and Girard Ave., over the tracks of the Philadelphia & Reading; also for a bridge over the Pennsylvania RR. tracks at Twenty-ninth and Berks Sts.

**PORTLAND, ORE.**—The contract for the six fixed spans east of the draw in the Madison St. bridge has been let to Wakefield & Jacobson at \$29,975.

**RICHFIELD, UTAH.**—The County Commissioners have ordered a new bridge built on the county road in King's Meadow Canyon below Willow Patch.

**ROCKVILLE, PA.**—Reports state that the Pennsylvania RR. contemplates rebuilding the bridge over the Susquehanna River at Rockville, Dauphin County, about five miles north of Harrisburg.

**SAGINAW, MICH.**—The Board of Supervisors at a recent session decided to raise money by a tax to repair the Merrill bridge across the Tittabawassee River; also the town line bridge over the Cass River.

**SALEM, ORE.**—The bids for a steel bridge over the Santiam River at Stayton were rejected. W. W. Hall, County Clerk.

**THREE RIVERS, QUE.**—The St. Maurice Passenger bridge over the St. Maurice River at this place, which was burned on Oct. 27, will probably be replaced by a steel structure.

**TORONTO, ONT.**—The Toronto St. Ry., from Newport, has under consideration plans for a bridge at Sunnyside.

**WILKESBARRE, PA.**—The question of bridging the pond holes on the West Market St. flats between Wilkesbarre and Kingston is again being discussed by the Board of Trade. It is estimated that \$45,000 is needed for this work, \$30,000 for the Wilkesbarre and \$15,000 for the Kingston bridge.

It is proposed to build an underground passage on East Market St. under the Lehigh Valley and Jersey Central tracks.

Viewers have been appointed for the Pittston Water St. bridge.

#### Other Structures.

**BELLAIRE, O.**—A vote will be taken at the November election on the proposition to issue \$40,000 city hall bonds.

**BOSTON, MASS.**—The Boston & Albany has completed plans for the new station at Dartmouth St.

**BRIGHTON, MASS.**—The plans for the Winship Primary School building, prepared by Whitman & Hood, are for a structure to cost \$65,000. The building will be located on Gighton Place.

**BROOKLYN, N. Y.**—L. M. Palmer's freight building at the foot of North Seventh St., Brooklyn, was destroyed by fire on Oct. 24. The damage is estimated at \$100,000.

Bids will be received until Nov. 13 by the Board of Education, Borough of Brooklyn, for the new public school No. 122.

**CHARLESTON, MO.**—J. F. Heggie, Clerk of Mississippi County, will receive proposals until Dec. 4 for \$25,000 of court house bonds.

**CHICAGO, ILL.**—The Committee on School Sites of the Board of Education decided Oct. 24 to recommend the building of 14 new schools and additions to schools. All the work is to be of modern construction and the cost will be about \$1,000,000. If the recommendation is approved by the Board of Education the City Council will be asked to include an appropriation in the next Budget in February, 1900.

Dankmar Adler has completed plans for remodeling the 6-story wholesale building, 90 x 141 ft., at Market and Monroe Sts., at a cost of \$60,000.

Plans for another mercantile structure have been made by Hessemmueller & Meldahl for R. Gottlieb. The building is to be used for wholesale grocery purposes and will be built at 117-121 Randolph St. It will be six stories and basement, with 55 x 90 ft., and will have steel frame, pressed brick front, steam heat and elevator service. The cost is estimated at \$40,000.

The Chicago National Bank will build a new building at 148-154 Monroe St. F. W. Kraft and F. M. Bailey are interested.

The Chicago, Rock Island & Pacific and the Lake Shore & Michigan Southern will build a new passenger station when the tracks are raised.

**CINCINNATI, O.**—The trustees of the Cincinnati Southern are said to be considering an issue of bonds to provide terminal facilities in Cincinnati.

**DORCHESTER, MASS.**—The new Phillips Brooks Grammar School building to be built on Quincy and Perth Sts. and Phillips Ave., Dorchester, will be from plans of Mr. A. Warren Gould. It will be 151 x 72 ft.

**DURAND, MICH.**—Reports state that the proposed general passenger station to be built in Durand by the Grand Trunk and the Ann Arbor railroads will not be begun until next April.

**FOND DU LAC, WIS.**—A hotel for railroad employees, a round house and machine shops will be built by the Wisconsin Central at North Fond du Lac.

**FORT DODGE, IA.**—The Illinois Central will, according to report, build a new freight depot in this city. The building is to be 50 x 300 ft. Estimated cost, \$40,000.

**GREENVILLE, PA.**—The Merchants National Bank of Greenville has been incorporated, with a capital of \$60,000, and proposes to build a new building of steel skeleton in Greenville.

**HARTFORD, CONN.**—The Stanley Works is to build two new buildings of large capacity for storage purposes. One of the buildings will be 80 x 104 ft. and 14 ft. high and the other 80 x 144 ft. and 16 ft. high.

**HAVERFORD, PA.**—A new gymnasium will be built at this place for the Haverford College. Field & Medary of Philadelphia have prepared the plans.

**HOBOKEN, N. J.**—The Hamburg-American Line Terminal & Navigation Co. was incorporated last week to build new piers on the Hudson River in Hoboken for the Hamburg-American line. The company has acquired 250 ft. of water front from the Pennsylvania RR. and proposes to build five new piers, one a double-decker.

**LEBANON, PA.**—The Pennsylvania Furnace Co., which recently bought the Sheridan furnaces from E. B. Grubb, will rebuild one of the furnaces. The new company's capital is \$3,000,000.

**MEMPHIS, TENN.**—The Memphis St. Ry. will build a car barn to cost \$200,000.

**MT. HOLLY, N. J.**—Burlington County, in the near future, will issue \$60,000 of bonds for an asylum.

**MUNCIE, IND.**—The Big Four contemplates a rearrangement of the freight station and bulking tracks so as to handle more business. The work contemplates nearly doubling the size of the present passenger station, which is entirely too small. It is doubtful if anything is done on this work this fall. The present freight station is a frame building, which will be moved to a new location and enlarged. The present passenger station is a small but attractive pressed brick building, which will be added to and enlarged. The exact plans for the passenger station have not been decided upon.

**NEWARK, N. J.**—A committee has been appointed in charge of the project of building a new city hall.

**NEW YORK, N. Y.**—Mr. William Waldorf Astor has submitted plans to the Building Department for an 8-story flat house to be built on the east side of Seventh Ave., to cover the entire block from 116th to 117th Sts. The building will accommodate 93 families and cost about \$500,000. Messrs. Clinton & Russell are the architects.

The Caledonian Fire Insurance Co. of 27 Pine St. will build a 12-story steel skeleton construction office building at 50 and 52 Pine St. Mr. James B. Baker of 156 Fifth Ave. is the architect.

Leo Wise proposes to build a mercantile building at the northeast corner of 16th St. and Fifth Ave. The building will be of skeleton construction, with a front of limestone, light brick and terra cotta. The estimated cost is \$350,000. Mr. Louis Korn, 37 Malden Lane, is the architect.

A 7-story warehouse will be built at the southwest corner of Vestry and Hudson Sts., by Wm. C. Dewey. The plot is 33 x 100 ft.

A 6-story fireproof brick factory, 100 x 60 ft., will be built at DePeyster, Water and Pine Sts., at a cost of about \$40,000, by Edward Kemp of 68 William St. Mr. A. H. Thorp is the architect.

A 7-story brick store and shop will be built at 17 Orchard St. by Mr. C. Saul. Chas. Rentz of 153 Fourth Ave. is the architect.

Plans have been filed with the Building Department for the new residence for Andrew Carnegie, to be built on Fifth Ave., between 90th and 91st Sts. It will have a frontage of 182 ft. and a depth of 72 ft. The estimated cost is \$500,000.

**PETERSBURG, VA.**—H. J. Collier, of Chattanooga, Tenn., has the contract to build the 13 stations for the Richmond, Petersburg & Carolina.

**PHILADELPHIA, PA.**—W. S. Thorp has prepared preliminary plans for a large hotel contemplated at Eleventh and Arch Sts. It will be fireproof and of steel construction.

The Pennsylvania RR. will make improvements at the Broad St. Station.

The Baltimore & Ohio will build a pier at the foot of Snyder Ave., 585 ft. long and 129 ft. wide, according to report.

Wm. Cramp & Sons Ship & Engine Building Co. has let a contract to the Berlin Iron Bridge Co. for the additions to the plant. The new machine shop will be 142 x 350 ft.

A \$60,000 addition is proposed to the Insane Department of the Philadelphia Hospital. The city has not appropriated this money.

The Fifteenth St. M. E. Church, Rev. G. W. Benson, Pastor, contemplates building a new church at Broad and Westmoreland Sts.

Reports state that a large fireproof building of steel skeleton construction will be built on Chestnut St., near Broad.

Messrs. Hazelhurst & Huckle, architects located in the Girard Bldg., are preparing plans and specifications for an office building at 1414-16 South Penn Sq., the approximate cost of which is \$300,000.

A fire on Oct. 29 destroyed the block bounded by Canal and Second streets and Germantown Avenue, causing a loss of about \$150,000.

**PITTSBURGH, PA.**—The Pittsburgh Steel Foundry Co. will, according to report, soon let a contract for building 100 dwellings near Glassport. The total cost of the work in contemplation is placed at \$125,000.

**PORTAGE LA PRAIRIE, MAN.**—The Winnipeg Elevator Co. will build a large grain elevator near this place.

**ROCK ISLAND, ILL.**—The Central Trust & Savings Bank has been organized, with a capital of \$100,000, by L. S. McCabe, Chas. L. Walker and others, who propose to build a new bank building in Rock Island.

**ST. LOUIS, MO.**—A cement plant estimated to have a capacity of 2,000 barrels per day will be built on Prospect Hill near the C., B. & Q. A. M. Stewart is interested.

A new Bank of Commerce building is contemplated at Broadway and Olive St.

J. Kennard & Sons Carpet Co. propose to build a 7-story building at Fourth and Washington Ave.

**SALT LAKE CITY, UTAH.**—Local reports state that the City Council has been petitioned for a franchise for a proposed union station on Third South near Fourth West St., by the Oregon Short Line and the Rio Grande Western. It will be necessary to close several streets and alleys to build this proposed depot, and it may be that this will delay the matter.



**SEATTLE, WASH.**—The Northern Pacific has proposed to the city officials of Seattle to put up a fine new passenger station in that city as soon as certain grants of land are made, including changes necessary in streets. A plan and perspective of the building, made by Mr. Cass Gilbert, of St. Paul, has been published in the Seattle Post-Intelligencer. The proposed building is 100 ft. x 240 ft. with a tower 180 ft. high. The main waiting room is in the center of the building, circular in form, and about 75 ft. in diameter. The proposed location is at Western Ave., Marion and Madison Sts., about 200 ft. west of First Ave.

**SPOKANE, WASH.**—The Great Northern proposes to build a new freight depot in Spokane. The plans which have been submitted to the City Court propose a building 50 x 600 ft. Other improvements are contemplated.

**URBANA, ILL.**—The Committee appointed to select plans for the addition and improvements to the Court House has accepted the revised plans of Royer & Brown. Almost all of the present walls and foundations will be retained. It is intended to let the contract for the foundation so that it can be commenced this fall and stand over until spring, the other work to commence about April 1. The addition will be about 34 x 23 ft., three stories high, with a tower 125 ft. high. The entire building will be of brick and fireproof construction, with slate roof. Bids will be received at the office of F. E. Eubeling, Urbana, Ill., until Nov. 14, at 10 a. m., for labor and material for the foundations, according to the plans prepared by Royer & Brown. Plans may be seen at the architects' office, City Bldg., Urbana. (Sept. 22, p. 666.)

**WASHINGTON, D. C.**—Messrs. Ackerman & Ross of 156 Fifth Ave., New York, are the architects for the new public library building to be built in Washington, D. C. It will be built in Mt. Vernon Square and will be 224 ft. long and 112 ft. wide. The approximate cost is placed at \$350,000. The library commissioners will receive proposals for this building, which will have a steel skeleton, next March. Work is to be begun early in March.

#### MEETINGS AND ANNOUNCEMENTS.

##### Dividends.

Central of N. J.—Quarterly, 1 per cent., payable Nov. 1.  
Coney Island & Brooklyn—Quarterly, 2½ per cent., payable Nov. 1.  
Pittsburgh, Virginia & Charleston—Semi-annual, 3½ per cent., payable Nov. 1.  
Rio Grande Western—Quarterly, preferred 1¼ per cent., payable Nov. 1.  
Rome, Watertown & Ogdensburg—Quarterly, 1¼ per cent., payable Nov. 15.

##### Western Society of Engineers.

A meeting of the Western Society of Engineers was held Wednesday evening, November 1, in the Society rooms, Monadnock Block, Chicago. Mr. G. A. M. Liljencrantz read a paper, which was illustrated by lantern slides, entitled "Crib Construction, with Brief Methods for Estimating the Cost." Also, Mr. Onward Bates showed a broken drawbridge pinion shaft and a portion of bridge piling that had been destroyed by beetles, and discussed the causes of these two failures.

##### The Railway Club of Great Britain.

The newly formed Railway Club of Great Britain has taken definite shape and its Secretary is Mr. J. F. Gairns, 118 Maroon St., Line House, London, E. The objects of the Club are to collect and disseminate information and it is proposed to form a great organization with correspondents and representatives in every town in the Kingdom and with a periodical journal containing club news. It is proposed to establish special meeting places at various centers, to make arrangements for reading-rooms and to encourage lectures.

##### Railway Signaling Club.

The annual meeting of the Railway Signaling Club will be held on Nov. 14 at 2.30 p. m. at Young's Hotel, Boston, Mass. The following papers will be read: "Progress in Signaling," by H. M. Sperry; "Automatic Signaling—Normal Safety vs. Normal Danger," by A. J. Wilson; "Possibilities of Three Position Signaling," by Frank Rhea, Signal Inspector, Pennsylvania Lines West of Pittsburgh.

For the morning of the 15th the club has been invited to inspect the Boston terminal station and the electro pneumatic interlocking there. Special rates have been secured from Young's Hotel.

##### Central Railway Club.

The September meeting was held at the Brooks Locomotive Works, as already stated in this journal. The special train which took the Club there was provided by the Lake Shore and drawn by engine No. 564 (Brooks Works) which made the famous run in 1895, and which, on this occasion, was driven by the same engineer, Mr. William Tunkey. The 45 miles to Dunkirk was made at a mile a minute. After a visit to the works the business session of the Club was called to order in the schoolroom. There was considerable discussion of the subject of freight car roofs. After some routine business, luncheon was served by the Brooks Locomotive Works. Among the speeches on this occasion was one by Mr. Tunkey, the engineer who ran 564 when she made her record. He gave an interesting account of some of the preliminary discussion and of some of the events of the run.

The next meeting of the Central Railway Club will be held at Hotel Iroquois, in Buffalo, Nov. 10, at 10 o'clock in the morning. A committee has been appointed to arrange for an entertainment. Probably a visit will be made to the Union Iron Works. The report of the committee on "Round House Practice," which was received at the March meeting, will be taken up. The special committee on "Interpretation of the New Rules of Interchange," consisting of H. F. Ball, H. C. McCarty and E. G. Rouse, will present their report. Other subjects and the committees appointed to report thereon, are as follows:

"Lubrication of Freight and Passenger Equipment; most Satisfactory and Economical System as Evidenced by Practice." Committee: C. N. Dow, Chairman; John MacKenzie and Robert Gunn.  
"Inspection and Maintenance of Air Brake Equipment at Terminals and on Cars in Transit to Expedite the Movement of Traffic." Committee: J. R. Petrie, Chairman; E. D. Bronner and L. I. Knapp.  
Memorial to the late R. Caffrey, S. Higgins, A. M. Walt and E. D. Bronner.

##### The Engineers' Club of Philadelphia.

A business meeting will be held on Saturday, November 4, at 8 P. M. The Tellers will then announce the result of the election of new members.

The postponed paper on "Long-Span Bridges," by Prof. Wm. H. Burr, Columbia University, New York, will be presented.

At the meeting Oct. 21 a discussion upon the subject, "Philadelphia; What Are Its Needs?" was opened by Mr. H. V. B. Osbourn, who called attention to what he considered the most important improvements necessary in the city's water supply, harbor, rapid transit, parks and streets and public buildings.

Mr. Harrison Souder followed with an exhibition of lantern views, illustrating improvements which have been made at Paris and Berlin, and Washington and Philadelphia.

Mr. L. Y. Schermerhorn described the improvements made during the past ten years in the channel of the Delaware River and the wharves along its banks, and stated that the Government would probably continue the deepening of the river so as to give it a 30-ft. outlet to the sea.

Mr. James Christie called attention to the necessity for the establishment of large shipyards in connection with the proposed increase of commerce from this port, and after enumerating some of the municipal improvements which have been made, attributed the slowness in the other directions to Philadelphia's poor municipal system.

##### The American Society of Civil Engineers.

A regular meeting was held at the Society House Wednesday, November 1, at 8.30 P. M. A paper by Edmund B. Weston, M. Am. Soc. C. E., entitled "Test of a Mechanical Filter," was presented for discussion. This paper was printed in the September number of Proceedings.

At the meeting to be held Nov. 15 a paper by Mr. Frank H. Cilley will be presented on "The Exact Design of Statically Indeterminate Frameworks; an Exposition of Its Possibility but Futility." This paper is printed in the October issue of the Proceedings. At the same meeting Mr. W. S. Dalrymple will give an address, with lantern slides, on "The Triangulation of Greater New York."

At the meeting of Dec. 6 a paper by Mr. James A. Seddon on "River Hydraulics" will be presented. It is printed in the October Proceedings. Another paper in the same issue is by Mr. A. H. Sabin on "Protection of Steel and Aluminum Exposed to Water." This will be presented at the meeting of Dec. 20.

The discussions which appear in the October Proceedings cover a variety of subjects presented in former issues of the Proceedings. These subjects are "The Theory of Concrete," "Counter Stresses in Railroad Bridges," "Impact Tests of Structural Steel," "Preservation of Cross Ties by Zinc Chloride," "Maximum Stresses in a Bridge Truss," "Pile Driving Formulas," "The Groined Arch as a Covering for Reservoirs, etc.," "Weights of a Three-Hinged and a Two-Hinged Arch," and "Wheel Concentrations and Fatigue Formulas." The same issue contains memoirs of Dr. C. E. Emery, Sir Casimir Gzowski, Mr. Francis Rinecker, Mr. R. D. Rowe and Mr. W. U. Scott.

#### PERSONAL.

(For other personal mention see Elections and Appointments.)

—Mr. G. G. Kulp, Vice-President of the Lewisburg & Buffalo Valley RR., and Miss Florence Billmeyer were married on Oct. 26.

—Capt. Charles E. Hall, Master of Construction for the Chicago City Ry. from 1881 to 1897, and previously from 1857 to 1863, engineer in charge of several railroads in Cuba, died Oct. 26, in Chicago. He was born in Copenhagen, Denmark.

—Mr. Octave Chanute sailed for Europe on Tuesday, the 31st, to investigate wood preserving methods. Mr. Chanute, as many of our readers know, has made special study of this matter for a number of years and has spared neither time nor expense in accumulating knowledge concerning it, and he is probably the first authority in America on this subject. We are disposed to believe that the field for his knowledge and labors will open up amazingly within the next few years.

—As we go to press it is known that the Vice-President of the United States, Mr. Garrett A. Hobart, is lying dangerously ill and there is small hope of his recovery. Mr. Hobart is well-known in railroad circles, having been one of the arbitrators of the Joint Traffic Association from the beginning of that Association in 1896 until he became Vice-President. Mr. Hobart's home is at Paterson, N. J., where he has long been a lawyer. He was born at Long Branch in 1844. He has long been prominent in political life in New Jersey and has been a member of both houses of the Legislature of that State. He is a Director in several railroad companies, manufacturing establishments and banks. Several years ago he was Receiver of certain New Jersey railroads during their reorganization.

#### ELECTIONS AND APPOINTMENTS.

Arizona & New Mexico.—M. Innes has been appointed Assistant General Superintendent.

Atchison, Topeka & Santa Fe.—John Player, Superintendent of Machinery, has been appointed Superintendent of Machinery of the entire A., T. & S. F. system, effective Nov. 1.

Birmingham & Atlantic.—C. Blinn has been appointed Auditor, succeeding M. O. Guiss, transferred.

Central RR. of New Jersey.—W. Dods, heretofore Trainmaster, has been appointed Assistant Superintendent. M. M. Richey, heretofore General Superintendent of the Chicago, Lake Shore & Eastern, has been appointed Trainmaster, with headquarters at Mauch Chunk, Pa., succeeding Mr. Dods.

Chicago & Northwestern.—W. D. Beck has been appointed Assistant Superintendent of the Galena Division, with headquarters at Chicago, Ill., succeeding W. Bennett, resigned.

Chicago, Lake Shore & Eastern.—C. S. McManus has been appointed General Superintendent, with headquarters at Joliet, Ill., succeeding M. M. Richey, resigned.

Chicago, Rock Island & Pacific.—A. R. Lingafelt is Assistant Superintendent of Telegraph, with headquarters at Topeka, Kan.

Chicago Terminal Transfer.—J. N. Faithorn, heretofore Vice-President and General Manager, has been elected President, effective Oct. 25. Mr. Faithorn continues as General Manager of the company.

Cleveland, Akron & Columbus (Pennsylvania Lines).—H. W. Byers has been appointed Superintendent, succeeding J. J. Henry, transferred, with headquarters at Akron, O. (See RR. News Column.)

Danbury & Norwalk.—At a meeting of the stockholders held Oct. 26, Charles P. Clark was elected Vice-President.

Delaware River.—At a meeting of the stockholders held Oct. 26, W. J. Sewell was elected President, J. R. McClure, Secretary, and J. M. Wood, Treasurer. At the same meeting the following Directors were elected: W. J. Sewell, W. S. Conover, H. C. Loudenslager, J. P. Green, C. E. Pugh, Samuel Rea and J. M. Moore.

Detroit River Terminal.—The officers of this company referred to in the Construction column are: President, Ellwood T. Hance, Union Trust Co., Detroit, Mich.; Treasurer, Wm. C. McMillan, 804 Union Trust Bldg.; Vice-President and Chief Engineer, Lewis Warfield, 616 Union Trust Bldg.; Resident Engineer, W. H. Ashwell, Bennett Bldg.; Secretary, John A. Russell, Detroit.

Delaware Valley, Hudson & Lehigh.—The officers of this company, referred to in the Construction column, are: President, J. H. Shull; Treasurer, W. S. Shafer; Secretary, Van C. Peters. These with M. F. Coolbaugh, F. W. Ellenberger, Harry P. Nice and Edwin F. Peters form the Board of Directors. The central office is Stroudsburg, Pa.

Elgin, Joliet & Eastern.—C. S. McManus, heretofore Superintendent, has been appointed General Superintendent, with headquarters at Joliet, Ill., and the office of Superintendent is abolished, effective Oct. 23.

Florence & Cripple Creek.—F. R. Rockwell has been appointed Trainmaster.

Gulf, Beaumont & Kansas City.—H. S. Spangler, heretofore General Manager of the Gulf & Inter-state, has been appointed General Auditor of the G., B. & K. C., with headquarters at Beaumont, Tex. F. A. Helbig, heretofore Secretary and General Auditor of the G., B. & K. C., has been appointed Treasurer, with headquarters at Beaumont, Tex.

Huntingdon & Broad Top Mountain.—At a meeting of the stockholders held Oct. 24, Geo. H. Colket was elected President, succeeding Spencer M. Janney, deceased.

Iowa Central.—The numerous rumors regarding W. I. Allen going to the I. C. as General Manager are officially said to be untrue.

Kansas City Suburban Belt.—F. B. Parker has been appointed General Superintendent, succeeding W. L. Stevenson, resigned.

Louisville & Nashville.—S. R. Knott, First Vice-President, has resigned.

Mexican Central.—W. C. Bradley has been appointed Terminal Superintendent, with headquarters at Tampico, Mex., succeeding C. H. Cook, resigned.

Missouri, Kansas & Texas.—J. W. Ford, Jr., has been appointed Freight and Passenger Agent, with headquarters at City of Mexico.

New England.—At the annual meeting held Oct. 26, at Hartford, Conn., the following Directors were elected: Royal C. Taft, Providence; John M. Hall, New Haven; Leverett Brainard, Hartford; Henry C. Robinson, Hartford; Carlos French, Seymour; J. Pierpont Morgan, New York; Charles P. Clark, New Haven; Edward D. Robbins, Hartford; Edward G. Buckland, Providence; Charles F. Brocker, Torrington, and Henry S. Lee, Springfield.

New York Central & Hudson River.—Schuyler Hazard, formerly connected with the Cleveland, Cincinnati, Chicago & St. Louis, has been appointed District Engineer of the N. Y. C. & H. R. RR., on special construction work, with headquarters at Albany, N. Y.

Omaha, Kansas City & Eastern.—A. J. Bandy, heretofore Assistant General Passenger Agent, has been appointed General Passenger Agent, relieving C. E. Gibbs to this extent. Mr. Gibbs, however, will retain control of the freight department as General Freight Agent. The office of Assistant General Passenger Agent is abolished.

Oregon RR. & Navigation Co.—R. B. Miller, Assistant General Freight Agent, will for the present assume the duties of General Freight Agent.

Pennsylvania Co.—The office of General Superintendent of Motive Power has been created and G. L. Potter, heretofore Superintendent of Motive Power of the Northwest System at Ft. Wayne, Ind., has been appointed General Superintendent of Motive Power, with headquarters at Pittsburgh, Pa. D. F. Crawford, heretofore on duty in the Motive Power department, has been appointed Superintendent of Motive Power of the Northwest system, with headquarters at Ft. Wayne, Ind., succeeding Mr. Potter, effective Nov. 1.

A. B. Starr has been appointed Assistant General Superintendent of Transportation, with headquarters at Pittsburgh, Pa. A. M. Schoyer has been appointed Superintendent of the Eastern Division, succeeding Mr. Starr. C. E. McKim has been appointed Superintendent of Telegraph, succeeding Mr. Schoyer. L. G. Haas has been appointed Superintendent of the Erie & Ashtabula Division, succeeding H. W. Byers, effective No. 1.

Philadelphia & Reading.—L. A. Shepard, Mechanical Engineer, with headquarters at Reading, Pa., has resigned, effective Oct. 31.

Pittsburgh, Shawmut & Northern.—J. P. Synder, heretofore Assistant General Freight and Passenger Agent, has been appointed Assistant to General Manager B. E. Cartwright.

Plant System.—J. Stuart Thomson has been appointed Assistant Manager of Steamships, with headquarters at 12 W. 23d St., New York City. Mr. Thomson has also been appointed Assistant to the



President of the Canada Atlantic & Plant Steamship Co., effective Nov. 1.

**Southern Missouri & Arkansas.**—J. C. Fisher has been appointed Master Mechanic, succeeding Mr. Quackenbush, resigned.

**Washburn, Bayfield & Iron River.**—P. T. Hackett, heretofore Trainmaster of the Detroit & Mackinac, has been appointed Superintendent of the W., B. & I. R., with headquarters at Washburn, Wis.

**Washington & Columbia River.**—At a meeting of the stockholders held at St. Paul, Minn., the following Directors were elected: C. H. Coster, G. H. Earl, Jos. McCabe, A. R. Burford, J. L. Sharpstein, F. W. Paine and R. Smith.

**Wheeling & Lake Erie.**—At a meeting of the stockholders F. J. Hearne of Wheeling, W. Va., W. G. Mather of Cleveland, O., and C. M. Spitzer of Toledo, O., were elected Directors. E. B. Coolidge, heretofore Assistant General Freight and Passenger Agent, has been appointed General Freight and Passenger Agent, with headquarters at Cleveland, O., succeeding J. F. Townsend, resigned.

E. W. Winter on Oct. 23 was elected Chairman of the Board of the W. & L. E.

#### RAILROAD CONSTRUCTION. New Incorporations, Surveys, Etc.

**ALTON & EASTERN.**—Grading is to be begun within 30 days, according to report, on this line of the Imperial Coal Co., from Alton, Ill., east about 60 miles to Vandalla, on the Illinois Central. J. S. Alexander of Columbia, Mo., is President, and B. L. Dorsey of Alton, Ill., Vice-President.

**ATCHISON, TOPEKA & SANTA FE.**—Surveys are reported completed for a branch from near Brookside, Col., north 42 miles along Four-mile Creek into the Cripple Creek mining district.

Improvements are reported in progress on the terminals at Bellville, Tex. B. Lantry Sons have the contract.

**ATLANTIC COAST LINE.**—The extension from Denmark, S. C., northwest 34.7 miles to Robbins, was opened for traffic Nov. 1. (Sept. 22, p. 667.)

**BRITISH COLUMBIA ROADS.**—D. C. McDonnell gives notice of application to the British Columbia Legislative Assembly at its next session for an act to incorporate a company to build a railroad from a point on or near Dyea River, on the international boundary between British Columbia and Alaska, to a point on or near Lake Bennett and thence to the 60th parallel of latitude.

**BUFFALO, ROCHESTER & PITTSBURGH.**—Surveys are to be begun at once, according to report, for a branch line from Echo, Pa., on the Allegheny & Western line, to run south to Rural Valley.

**BURLINGTON, CEDAR RAPIDS & NORTHERN.**—A large force of men is improving the line near Cedar Rapids, Ia., by straightening the alignment and changing the grade.

**CANADIAN NORTHERN.**—Rails are to be laid to a point 30 miles beyond Swan River this season, on the Lake Manitoba Railway & Canal Co.'s extension northwest. The contractor has 65 teams and all the men he can get grading the Gilbert Plains branch and expects to have 15 miles ready for rails this month. (June 23, p. 460.)

**CANADIAN PACIFIC.**—The company is making arrangements with the Metropolitan Ry. Co., which runs an electric railroad from Toronto north, for an exchange of traffic. It is proposed that the electric line haul grain from Newmarket, where an elevator is to be built, by electric engines. The application for making a connection between the two systems at North Toronto is now before the Privy Council of the Dominion Parliament. This will give the C. P. RR. practically a branch line to Newmarket, 34 miles north of Toronto.

Building on the Waskada & Western extension from Deloraine, Man., westward has been stopped six miles short of its intended terminal point. The section has been graded but no rails laid. (June 23, p. 460.)

Building on the North Star branch from Cranbrook, B. C., to the North Star line, 30 miles, is handicapped for want of laborers and rails. Twelve miles is graded but no track laid. The company hopes to complete 18 miles this year. (Sept. 22, p. 667.)

**CASSIER CENTRAL.**—About four miles of grading is completed on this line from Glenora, B. C., north via Dease Lake to Teslin. D. Self, of Fort Wrangel, Alaska, is General Manager. (Dec. 2, 1898, p. 867.)

**CHICAGO & EASTERN ILLINOIS.**—The company is reported to have bought land at Dolton, Ill., on which to build a yard of 3,000 freight car capacity.

**CHICAGO & NORTHWESTERN.**—Track laying is reported begun on the Harlan & Kirkman extension from Kirkman, Ia., south seven miles to Harlan, on the Chicago, Rock Island & Pacific. (Oct. 20, p. 737.)

This company, according to report, will begin surveys immediately for an extension from Michigamme, Mich., northwest about 55 miles to Houghton.

**COLORADO & WYOMING.**—About five miles of grading is completed on this line from Badger, Wyo., on the Colorado & Southern, to run 16½ miles to Hartville. J. R. De Remer of Denver, Col., has the contract. It is being built by the Colorado Valley & Iron Co. of Denver, which will supply the rails. (Oct. 20, p. 737.) T. C. Osgood is President and Wm. Porter Chief Engineer, both of Denver. (Official.)

**CHICAGO, BURLINGTON & QUINCY.**—Extensive improvements are reported determined upon for the Illinois approaches to the Burlington bridge across the Mississippi, and also for changes of alignment between Burlington and Galesburg, particularly in the vicinity of Gladstone.

Track is reported laid for 17 miles on the extension from Alliance, Neb., south about 160 miles to Brush, Colo., near Denver. (June 23, p. 460.)

**CHICAGO, PADUCAH & SOUTHEASTERN.**—This company has been incorporated in Illinois with a capital stock of \$50,000 to build a railroad from Vienna southeast about 30 miles via Metropolis to a point in Massac County, opposite Paducah, Ky.

The incorporators and first Board of Directors are: A. K. Vickers, Vienna; Frank P. Read, Marion; Elijah P. Curtiss, Metropolis; John V. Norcross and John A. McKeown.

**CLEVELAND, BARBERTON & WESTERN.**—This company has been incorporated in Ohio to build a railroad from Fairlawn, on the Northern Ohio, to run south to the coal fields of Wayne County, with probable further extensions into Holmes and Knox counties.

**DELAWARE, LACKAWANNA & WESTERN.**—An officer writes that plans are being prepared to abolish grade crossings at Morristown, N. J.

**DELAWARE VALLEY, HUDSON & LEHIGH.**—This company, whose property was recently sold, was reorganized at Stroudsburg, Pa., Oct. 27. Officers state that it will be built within a year. It is to run from Stroudsburg northeast about 45 miles up the Delaware River to Matamoras. The officers are given under Elections and Appointments. (July 7, p. 500.)

**DETROIT RIVER TERMINAL.**—An officer writes that this property is to be of the nature of a belt line and is to run from Detroit, Mich., via Delrey, Ecorse, Wyandotte and Trenton, to Slocum Junction, 16 miles. It will connect the Michigan Central, the Detroit & Toledo Shore Line, the Lake Shore & Michigan Southern and the Detroit & Lima Northern. The officers are given under "Elections and Appointments." (Aug. 4, p. 561.)

**EASTERN OHIO.**—An extension, according to report, will be built from Lore City, O., on the Baltimore & Ohio, to run northeast about 20 miles to Freeport, to connect with the Cleveland, Lorain & Wheeling. It is said that the B. & O. is to operate the line.

**EDMONTON DISTRICT.**—Arrangements are to be completed next month for completing 50 miles of this line from South Edmonton, B. C., to Edmonton, and thence northwest via Albert and across the Athabasca and Peace rivers to Telly River. A. G. Blair, Jr., is among the owners.

**GALETON, SOUTH BRANCH & GERMANIA.**—An officer writes that the proposed extension from Gaines, Pa., along Painter Run to Leetonia, 33 miles, is indefinitely postponed. (Oct. 21, 1898, p. 768.)

**GEORGIA ROADS.**—The Willis & Cole Lumber Co. of Blakely, Ga., has completed its line from Blakely, Ga., south seven miles into timber. (Jan. 27, p. 72.) It proposes to build two branches of three miles each east and west through the timber. (Official.)

**GREAT NORTHERN.**—Right of way has been secured for the proposed line from St. Bonifacius, Minn., northeast about six miles to Spring Park on Lake Minnetonka. (Oct. 13, p. 719.)

The company, according to report, has begun improvements at West Superior, Wis., which will call for an expenditure of \$500,000.

**GREAT NORTHERN (CANADA).**—Work is progressing favorably on the line between Ottawa and Quebec. Rail laying between St. Jerome and Lachute was begun on Oct. 24. (Sept. 1, p. 619.)

**GREAT NORTHWEST CENTRAL.**—D. J. McArthur, of Winnipeg, who has the contract for building this line, reports that there has been much delay on account of heavy snow falls. Grading is finished for 15 miles west of Hamiota, leaving six miles more to be completed. (Aug. 18, p. 589.)

**GUAYANDOTTE VALLEY.**—Surveys are in progress on this line from Huntington, W. Va., southeast 141 miles to Pineville and the Pocahontas coke and coal region. L. C. Caldwell of Huntington is interested. (March 10, p. 179.)

**HOLLY RIVER & ADDISON.**—The company has completed its line from Palmer Junction, W. Va., to Grassy Creek, 18.5 miles. The road is projected from Palmer Junction via Grassy Creek to Addison, 30 miles. (Aug. 18, p. 589.) Geo. A. Hechmer, of Palmer Junction, W. Va., is General Manager, and F. Barber Chief Engineer. (Official.)

**HOLSTON VALLEY.**—Grading is reported in progress on the extension from the Holston River to Fish Dam, Tenn., three miles. (April 21, p. 289.)

**INDIANOLA & SUNFLOWER CENTRAL.**—This company was incorporated in Mississippi Oct. 10, to build a railroad from Indianola north via Faisonla, Steiner and Lehton to the northern boundary of Sunflower County, and south from Indianola via Woodburn and Gumwood to the southern boundary of the county, in all about 50 miles. The incorporators are: G. W. Faison, Faisonla; W. S. Berry, Greenwood; R. A. Beall, A. B. Smith, R. P. Miller, J. Holmes Baker, Indianola, Miss.; G. K. Smith, Oxford, Miss.

**IOWA & MISSISSIPPI VALLEY.**—Chief Engineer Willis of the Muscatine North & South has completed the survey of this proposed line from Elrick, Pa., on the M. N. & S., to run south about 23 miles to Burlington. Maps and drawings are to be submitted within the next two weeks. Three-fourths of the right of way is secured, mostly by gifts. (Oct. 13, p. 719.)

**IOWA CENTRAL.**—Contracts are reported let for enlarging the Bartlett yards near Peoria, Ill. It will be necessary to fill in about 12 acres of land, and the yard will have additional capacity of about 1,000 cars.

**IOWA, MINNESOTA & NORTHWESTERN.**—Track is laid to Mason City, Ia., 60 miles, and 85 per cent. of the grading is completed for the rest of the way on this line from Fox Lake, Minn., via Fairmont, Blue Earth, Lake Mills, Ia., Mason City, Dumont, Parkersburg and Traer to Belle Plaine, 198.8 miles. There are 800 teams and 1,200 men at work. The Chicago & Northwestern is the contracting company. The rail is 72 lb. weight. This is to be the main line connecting the double track at Belle Plaine with the Dakotas. (Aug. 11, p. 575.) W. E. Brice of Mason City, Ia., is President, and E. C. Carter of Chicago, Chief Engineer. (Official.)

**JACKSON & HUNTINGTON.**—This company was incorporated in Ohio Oct. 23, with a capital stock of \$10,000 to build a railroad from Jackson on the Ohio Southern, to run south about 50 miles to Huntington, W. Va., on the Chesapeake & Ohio.

**KANAWHA & POCAHONTAS.**—A contract for building this line has been awarded to J. C. Carpenter of Clifton Forge, W. Va. The railroad is a coal line to be built from Dego, Kanawha County, W.

Va., on the Chesapeake & Ohio, to run south about 16 miles up the valley of Paint Creek to coal lands. Surveys have been completed for some time and building will be carried on during the winter. Tipple will be built on the Kanawha River for river shipments. C. M. Pratt is President and J. Russell Clark, Secretary. J. V. Davies, of the engineering firm of Jacobs & Davies, 32 Nassau St., New York, is Chief Engineer. The local affairs of the company are being carried on by R. C. Baldwin, General Agent at Dego, W. Va. (Official.)

**KANSAS, OKLAHOMA & GULF.**—The company has completed its line from Arkansas City, Kan., southwest 27 miles, via Peckham, Okla., to Blackwell, and it is now in operation by the St. Louis & San Francisco. (June 30, p. 483.) It is contemplated to build a further extension from Blackwell southwest 60 miles to Enid, Okla. (Official.)

**KINGSTON & PEMBROKE.**—An officer confirms the report that the company is building a branch from Calabogie, Ont., to the Caldwell and the Martell iron mines, five miles. The work is well under way and the company expects to have it finished before frost sets in. (Sept. 29, p. 685.)

**KOOTENAY RAILWAY & NAVIGATION.**—Rails are laid to a point within seven miles of a connection with the Canadian Pacific, but work is at a standstill on account of a lack of rails. The company will use several miles of the C. P. R., from which it will branch off three miles to the terminus at Kuskonook, B. C. (Oct. 27, p. 753.)

**MAINE CENTRAL.**—Track laying is reported in progress on the branch from Gardiner, Me., to the mills on the Cobscook River, about two miles. (Sept. 8, p. 633.)

**MEXICAN ROADS.**—A. O. Bailey, of Columbus, N. M., confirms the report that he has obtained a concession from the Mexican Government for connecting his road from Deming, N. M., with a point south in Mexico. (Oct. 20, p. 737.)

**MISSOURI MIDLAND.**—An officer confirms the report that the company has completed its line from McBaine, Mo., near Kennard, on the Missouri, Kansas & Texas, northeast 8.76 miles to Columbia. (Oct. 20, p. 737.)

**MISSOURI PACIFIC.**—Work is to be begun soon upon a proposed extension from Springfield, Mo., northeast about 80 miles to connect with the Bagdad branch south of Jefferson City, Mo. (Missouri Roads, July 7, p. 499.)

**MISSISSIPPI RIVER, COLESBURG & MANCHESTER.**—An officer writes that the company has sold to a Boston syndicate \$200,000 bonds, and the prospects are that work will be begun soon on this line from Dyersville, Ia., northwest about 20 miles, via New Vienna and Petersburg, to Colesburg. It is to run through a fine farming country. W. C. Kirchheck of Colesburg, Ia., is Secretary. (Oct. 27, p. 753.)

**MOSCOW & EASTERN.**—A party is out locating this line from Moscow, Ida., east 54 miles to Elk Creek. (Aug. 4, p. 561.) George Creighton, of Moscow, Ida., is President, and C. O. Brown General Manager. (Official.)

**NASHVILLE, CHATTANOOGA & ST. LOUIS.**—An officer writes that the company has under consideration an extension from Bon Air, Tenn., but nothing definite has been decided upon. (Oct. 27, p. 753.)

**NATCHEZ, COLUMBIA & MOBILE.**—There are 10 men and six teams at work on this line from Norfolk, Miss., northeast 21 miles, via Ruth and Camp Rooney, to a point two miles beyond Salsbury. (June 30, p. 483.) C. S. Butterfield of Norfolk, Miss., is Vice-President and General Manager. (Official.)

**NAZARETH & LEHIGH.**—Grading and track laying are completed for one mile on the extension from Nazareth, Pa., to the cement works near Christian Springs. There are 60 men and 10 teams at work. John C. Miller & Co., Nazareth, have the contract. (April 7, p. 253.) C. Miller of Bangor, Pa., is President, and Wm. A. Thomson, Chief Engineer. (Official.)

**NEW YORK, NEW HAVEN & HARTFORD.**—Work is to be begun at once, according to report, on the four-track improvements at Bridgeport, Conn. These have been delayed for a number of years on account of litigation. (March 25, 1898, p. 225.)

**NORTH CAROLINA ROADS.**—Grading is completed from Shelby, N. C., to within one-half mile of Lawndale, and track is laid to Double Shoal, nine miles, on this line of the Cleveland Cotton Mills Corporation of Lawndale, from Shelby north 12 miles to its mills at Lawndale. Work is completed on the bridges and trestles. J. R. Oates of Shelby has the contract. (Oct. 27, p. 753.) H. F. Schenck is President, and Fleming Ransaur, Chief Engineer, both of Lawndale. (Official.)

**NORTHERN PACIFIC.**—Seven miles of track is laid on the branch from Portage la Prairie, Man., north to Lake Manitoba. The Winnipeg Elevator Co. proposes to build a large elevator at the end of the branch. (May 26, p. 379.)

**ORANGE, CALL & PINE BELT.**—Dennis Call of Orange, Tex., President of this line, writes that the road has been turned into a logging road. It is proposed from Orange, Tex., via Call to Jasper, 63 miles, and has been completed from Salem to Call, 14 miles.

**OSHKOSH & STEVENS POINT.**—Grading is reported begun on this line from Oshkosh, Wis., northeast about 70 miles to Stevens Point. J. W. Edwards of Winneconne, Wis., is interested. (July 21, p. 531.)

**PENNSYLVANIA.**—Double tracking is reported nearly completed on the Philadelphia & Erie line over Kane Hill, between Wilcox and Kane, Pa. (May 26, p. 379.)

**PITTSBURG, BESSEMER & LAKE ERIE.**—An officer writes that there is nothing in the report that the company will soon begin double tracking its line at the southern end. (Oct. 7, p. 753.)

**PORT ANGELES EASTERN.**—Preliminary surveys have been completed to the town of Hoodport, on Hoods Canal, for this line from Port Angeles, Wash., east 110 miles via Sequina Bay to Olympia. Surveys are being pushed on to Olympia. Wm. Martell, of Port Angeles, Wash., is Superintendent of Construction. (July 28, p. 548.)



**PRINCE EDWARD ISLAND.**—W. Kitchen, of Fredericton, N. B., has been awarded the contract for straightening the curves on this line between Loyalist and Coleville, Col., to be completed by June, 1900.

**RIO GRANDE WESTERN.**—Changes in grade are under way at Oliver's, Utah, about 20 miles south of Salt Lake City.

**ST. PAUL & DULUTH.**—An officer writes that the report as to the proposed extensions at Rice's Point and West Superior, Wis., is without foundation. (Oct. 20, p. 737.)

**SAN ANTONIO & BROWNSVILLE.**—J. M. Aubrey of San Antonio, Tex., President of this company, is reported as saying that building will be begun in December. The line as projected is from San Antonio south about 275 miles to Brownsville. (Aug. 4, p. 561.)

**SOUTHERN.**—An officer writes that there is no foundation for the reports that his company will build branches from Goldhill, N. C., nor from Parrish, Ala. (Oct. 27, p. 753.)

**SOUTHERN PACIFIC.**—Bids are asked, according to report, for the first 15 miles of the extension from Wharton, Tex., southeast down Caney River. (Oct. 6, p. 702.)

The company also asks bids for the first 15 miles of the Texas & New Orleans extension from Rockland, Tex., northeast toward Nacodoches. It is to be extended ultimately to Cedar, the southern terminus of the Texas Trunk in Kaufman County, and work is in progress at that end of the line. (Oct. 6, p. 702.)

Announcement is made of the opening of the branch from Thibodaux Junction, La., northwest 22 miles to Napoleonville. Track was laid on this extension some years ago.

**TORONTO, HAMILTON & BUFFALO.**—The Hamilton, Ont., City Council has granted this company an extension of time to Dec. 31 for building its branch through the northeastern part of the city.

**UNION PACIFIC.**—An officer writes that there is nothing in the report of surveys for a cut-off west of Rawlins, Wyo. (Oct. 20, p. 738.)

**VIRGINIA & SOUTHEASTERN.**—Grading is practically completed from Elizabethton, Tenn., to Butler, 20 miles, on the extension from Elizabethton northeast 33 miles to Mountain City. The piers for the upper crossing of the Watauga River are being rapidly built. (Aug. 4, p. 561.)

**WARREN COUNTY.**—Application has been made to the New York State Railroad Commission for a certificate to build its proposed line from Warrensburg south about 10 miles to Caldwell, on Lake George.

**WHITE PASS & YUKON.**—Before the opening of navigation this company will have extended its line from Cariboo Crossing, B. C., at Lake Bennett, to a point below White Horse Rapids, and within a year to Fort Selkirk, according to a statement of G. W. Mitchell, who represents the road. It has been running from Skaguay, Alaska, to Lake Bennett, since June 22. The distance from Lake Bennett to Fort Selkirk is 185 miles, but the engineers say that building will be comparatively light. There were 1,110 men at work on Oct. 26. There have been three miles of snow sheds built similar to those of the Canadian Pacific in the Rockies. There is 15 miles of the line graded beyond Cariboo Crossing and a total of 42 miles is to be finished this year, if falls reach Lake Bennett in time to go by water to White Horse and Cariboo Crossing. There are 1,500 tons on the way. (Oct. 27, p. 754.)

**WISCONSIN CENTRAL.**—The company is grading and laying track for a terminal yard near Fond du Lac, Wis. (Oct. 13, p. 720.) The yards at Waukesha and Stevens Point will be abandoned and the company will build terminal yards at Fond du Lac and Abbotsford, Wis., making three freight divisions of 150 miles each between Chicago and St. Paul instead of four freight divisions as at present. (Official.)

#### GENERAL RAILROAD NEWS.

**CHICAGO & EASTERN ILLINOIS.**—The stockholders on Dec. 27 will vote to buy the capital stock of the two companies, the Evansville, Terre Haute & Chicago and the Indiana Block Coal RR. Co.

**CHICAGO & GRAND TRUNK.**—The company is arranging to refund the \$5,454,000 of its first mortgage 6 per cent. bonds, due Jan. 1, 1900. This refunding it is hoped will relieve the Grand Trunk from further advances on account of interest, and will enable the C. & G. T. to lay a second track as proposed.

**CHICAGO & WEST MICHIGAN.**—The coupons of the Chicago & North Michigan bonds due Nov. 1 will be paid in cash as in May last. (June 2, p. 394.)

**CLEVELAND, AKRON & COLUMBUS.**—The Pennsylvania RR., which bought this road in May last, took full possession on Nov. 1, and the road is to be operated as a portion of that system. (June 9, p. 418.)

**COLUMBUS, HOCKING VALLEY & TOLEDO.**—Car trust bonds, series A, to the amount of \$27,000, have been drawn for redemption at par and accrued interest on Jan. 1, 1900, at the Atlantic Trust Co. (Aug. 25, p. 604.)

**DELAWARE RIVER.**—This property, whose purchase was noted last week (p. 754), is controlled by the West Jersey & Seashore, but is to be operated under its own charter.

**DETROIT & LIMA NORTHERN.**—Judge Ricks in the United States Circuit Court at Toledo, O., on Oct. 20 authorized the receivers to issue \$500,000 additional receivers' certificates for improvements and rolling stock. This makes the total issue outstanding \$1,000,000. (Jan. 6, p. 17.)

**EVANSVILLE, TERRE HAUTE & CHICAGO.**—A special meeting of the stockholders is to be held at Terre Haute, Ind., Dec. 23, to consider a proposition of the Chicago & Eastern Illinois to buy the property. It has been leased and operated by the C. & E. I. for a number of years.

**FARMVILLE & POWHATAN.**—Colonel T. M. R. Talcott was made Receiver of this company Oct. 26 by order of Judge Miner of the Law and Equity

Court at Richmond, Va., on application of the bondholders, as noted last week (p. 757).

**FLINT & PERE MARQUETTE.**—The stockholders will meet Nov. 1 to adopt such measures as are necessary to carry out the proposed consolidation. (June 23, p. 462.)

**HUTCHINSON & SOUTHERN.**—Kansas press reports state that this property has been sold to the Atchison, Topeka & Santa Fe. The line runs from Hutchinson, Kan., to Blackwell, Okla., 130 miles. It went into the hands of a receiver Aug. 9, 1893. It was taken possession of by the new company Feb. 1, 1898. (Aug. 19, 1898, p. 604.)

**IOWA CENTRAL.**—An agreement has been entered into between this company and the Atchison, Topeka & Santa Fe, whereby the Iowa Central will ship all of its Chicago freight over the Atchison from Nemo, Ia.

**KANSAS CITY, ELDORADO & SOUTHERN.**—The price paid by the Missouri, Kansas & Texas for this property is \$1 subject to its bonded indebtedness of \$225,000. (Oct. 27, p. 754.)

**KANSAS CITY, PITTSBURGH & GULF.**—E. H. Harriman, who organized the syndicate that bought the Chicago & Alton, is reported to have formed another syndicate to underwrite the reorganization of the K. C. P. & G. The new company, it is said, will adopt a modification of the Philadelphia plan. It is stated that President A. E. Stillwell and associates are to have no interest in the property after reorganization. (Oct. 20, p. 738.)

**LOUISVILLE & NASHVILLE.**—Evansville, Henderson & Nashville Division bonds to the amount of \$40,000 have been drawn for the sinking fund for payment at 110 and interest, at the company's office, New York, on Dec. 1, interest to cease from that date. (Oct. 6, p. 702.)

**MONTEREY & MEXICAN GULF.**—The Higher Federal Court of the City of Mexico has affirmed the decisions of the lower court awarding Joseph A. Robertson and associates a judgment of \$150,000 gold against the Belgian bondholders of the road who are operating the company. This is for money advanced in building the road. (May 13, 1899, p. 530.)

**NORFOLK & SOUTHERN.**—The control of this property, acquired by the Norfolk, Virginia Beach & Southern, as noted last week (p. 754), is officially confirmed. It is further stated that the price paid for the majority interest of the capital stock (said to be about \$90 a share), will also be paid for the minority stock.

**NORFOLK & WESTERN.**—This company has bought the Belt Line RR. of Durham, N. C., taking possession Oct. 18. It is operated as a portion of the Durham branch of the Norfolk Division.

**OREGON RAILROAD & NAVIGATION.**—Holders of certificates of deposit of the Mercantile Trust Co., and of the Old Colony Trust Co., for preferred and common stock of the O. R. & N., are notified that upon surrender of the certificates they will receive new stock of the Union Pacific under the terms of the transfer. Of the \$7,718,600 common stock outstanding, \$4,970,800 has been acquired, and of the \$11,000,000 preferred stock, \$7,959,004 has been exchanged. (July 21, p. 532.)

**OREGON SHORT LINE.**—Holders of certificates of deposit of the Mercantile Trust Co., and of the Old Colony Trust Co., for collateral trust non-cumulative income B bonds, are notified that upon surrender of the certificates, they will receive new preferred stock in the Union Pacific Co. Holders of \$13,376,500 of these bonds have accepted the plan of exchange out of a total of \$14,841,000. Of the Oregon Short Line income A bonds, \$5,378,000 have been exchanged out of a total of \$7,185,000. (Oct. 6, p. 702.)

**PITTSBURGH & WESTERN.**—The Preferred Stockholders' Committee announces that over 87 per cent. of the \$5,003,000 preferred stock has been deposited, and that further deposits may be made with the Knickerbocker Trust Co., New York, on or before Dec. 1.

Judge White on Oct. 27 handed down an opinion refusing to certify to the suit of this Committee, filed at Pittsburgh, Pa., Oct. 17, to restrain the Baltimore & Ohio from voting over 130,000 shares of the common stock. (Oct. 27, p. 754.)

**RALEIGH & GASTON.**—The stockholders of this line of the Seaboard Air Line will meet at Raleigh, N. C., Nov. 29, to consider the consolidation into the company of the following companies: The Raleigh & Augusta Air Line, the Durham & Northern, the Roanoke & Tar River, the Seaboard & Roanoke, the Louisville, the Carolina Central, the Palmetto, the Chesterfield & Kershaw, the Georgia, Carolina & Northern, the Seaboard Air Line Belt, the Georgia & Alabama, the Florida Central & Peninsular, the Georgia & Alabama Terminal, the Logansville & Lawrenceville RR. of Georgia, the Richmond, Petersburg & Carolina, the Pittsboro and the Southbound. They will also act upon the questions of a change of name and an increase of capital stock from \$1,500,000 to \$71,625,000. (Sept. 15, p. 650.)

**ST. LOUIS SOUTHWESTERN.**—The Directors announce a payment of \$16.78 on Jan. 1 on each coupon of the \$9,000,000 second mortgage bonds outstanding. The first payment of 2 per cent. for 1898 was made July 1 last. (June 30, p. 484.)

**SIOUX CITY & NORTHERN.**—The foreclosure sale is to take place at Sioux City, Ia., Dec. 12. (Oct. 13, p. 720.)

**TOLEDO, ST. LOUIS & KANSAS CITY.**—Holders of more than \$4,000,000 of the \$9,000,000 first mortgage bonds have assented to the proposition giving H. O. Armour, O. T. Banner and M. S. Patton an option to June 1, 1900, to buy the certificates of deposit representing their holdings for cash at par and interest at 4 per cent. from the date of the first default in December, 1892. (June 16, p. 440.)

**UNION PACIFIC.**—Howard S. Abbott, Special Master in the receivership of the old company, has filed a report in the United States Circuit Court at Minneapolis which is confirmed by Judge Sanborn. Among the claims allowed are \$7,395,294 to the United States Government; \$2,457,969 of judgment obtained April 22, 1898, and held by Lawrence Greer; \$1,877,538 to E. C. Benedict and the bondholders' committee, and \$333,561 to Josiah B. French

and others. The total claims allowed in addition to \$26,248,720 already allowed, are \$56,641,921. Mr. Abbott finds that the balance due the Union Pacific Co. is \$44,500,000. The claims disallowed aggregate about \$10,000,000. (June 30, p. 484.) See also Oregon RR. & Navigation and Oregon Short Line above.

**WABASH.**—The company has leased the track of the Chicago, Burlington & Quincy from Quincy, Ill., along the east side of the Mississippi River to Hannibal, and is to begin Nov. 15 running trains from Quincy via Hannibal to Kansas City.

#### TRAFFIC.

##### Traffic Notes.

The receivers of the Kansas City, Pittsburg & Gulf have reached an agreement with their competitors and the Federal Court has been asked to dismiss the "boycott" suit.

It is reported that the Canada Atlantic has made an arrangement with the Chicago, Milwaukee & St. Paul on lake and rail business. It applies chiefly to territory southwest of Milwaukee.

It is announced that the New Haven Steamboat Company, which for several months has been running boats between New York and Providence, will continue that service through the winter.

The Association of Pacific Coast Wholesale Merchants, to take action concerning rates on freight from the East, has been made a permanent body with the name "The Pacific Coast Jobbers' & Manufacturers' Association."

The transcontinental railroads have issued a new tariff, advancing freight rates 25 per cent. on shipments to Asia, cotton excepted. The new rates affect shipments from points east of the Missouri River to all Oriental points.

It is reported that the Missouri, Kansas & Texas has discontinued its through traffic arrangements with the International & Great Northern and has made alliance with the Aransas Pass and the Southern Pacific for a through car service between St. Louis and San Antonio.

The Railroad Commissioners of Texas have issued an emergency tariff of eight cents per 100 lbs. on oats to the four principal ports. It is said that the railroads object to using this rate and will endeavor to continue in force the former rate of 15 cents by classing shipments as interstate. It appears that a large share of the shipments affected go forward by water and the railroads intend to find, whenever they can, the ultimate destination of a shipment and charge accordingly. The Commission made the reduction from 15 cents to eight for the purpose of making the rates correspond with certain competitive interstate rates which the railroads had put in force.

##### Chicago Traffic Matters.

Chicago, Nov. 1, 1899.

The fight between the Burlington road and the lines running southeast from Kansas City over packing house products and rates, in which there has just been declared a truce, has been one of those purely western battles of sectional trade jealousy, one of the last surviving features of the trans-Missouri boom that for years blocked the legitimate growth of all that naturally rich country lying between the muddy river and the peaceful ocean. Shippers of packing house products from Omaha induced the Burlington road to try to wipe out the Kansas City differential. Just why Omaha ought to demand the same rate to common southeastern points as was enjoyed from Kansas City, several hundred miles nearer the field to be supplied, is not clearly explained, except by the good old western phrase, "discrimination." The Burlington road reduced the rate to Memphis and other southeastern points. Then followed a fight lasting several weeks. Officers of the Burlington and of the Kansas City-Memphis roads stood for weeks with uplifted rate-cutting knives, and meanwhile the patriotic citizens of the two cities, particularly those of Kansas City, howled at each other, through the newspapers, boycotted the Burlington and incidentally gave that road a large amount of free advertising. When rates reached bed rock a truce was declared until arbitration could be agreed upon. Pending solution of the problem, rates go back to where they were six months ago, with the rate from Kansas City six cents less than from Omaha.

The car famine in the northwest has reached a point where two roads have called in all their traveling freight and passenger agents and put them to work hunting up freight cars.

There is now little prospect of getting the three outside Chicago-St. Paul lines into the Western Passenger Association. Several attempts have been made to get the executive officers of these roads to attend a meeting here to consider the question, but each has failed by reason of the alleged inability of representatives of one or two of the outsiders to be present. Meanwhile the low passenger rates between Chicago and the twin cities and the principal Missouri River terminals continue in effect.

Traveling men and others interested in mileage tickets in the western territory have renewed, with considerable vigor, the fight against the Sebastian interchangeable ticket. General Passenger Agents of two of the largest western roads have come to the conclusion that heed must be given to this protest. The northwestern branch of the traveling men's association is now holding a mass meeting in Chicago, principally for the purpose of protesting against the present form of mileage ticket.

The meeting of the Interstate Commerce Commission in St. Louis to hear complaints of St. Louis and Chicago jobbers on alleged discriminations in freight rates to California has been postponed until Nov. 13.

At the request of the General Counsel of railroads centering in this city, the Commissioner of Internal Revenue has made a ruling in reference to stamping bills of lading when stamped shipping receipts have been issued for the same shipment. He says: "Any written evidence of receipt and forwarding, such as a memorandum receipt or dray ticket, will answer the requirement of the law, and this evidence must be stamped when issued. If such memorandum receipt is afterward exchanged for a more elaborate contract or bill of lading, the bill of lading so issued will require no stamp if it is endorsed: 'This bill of lading is issued in lieu of a duly stamped memorandum receipt for the same shipment of goods now on file in the company's office.' No duplicate of either the memorandum or the bill of lading can be issued without being stamped, as the law expressly taxes such duplicate."